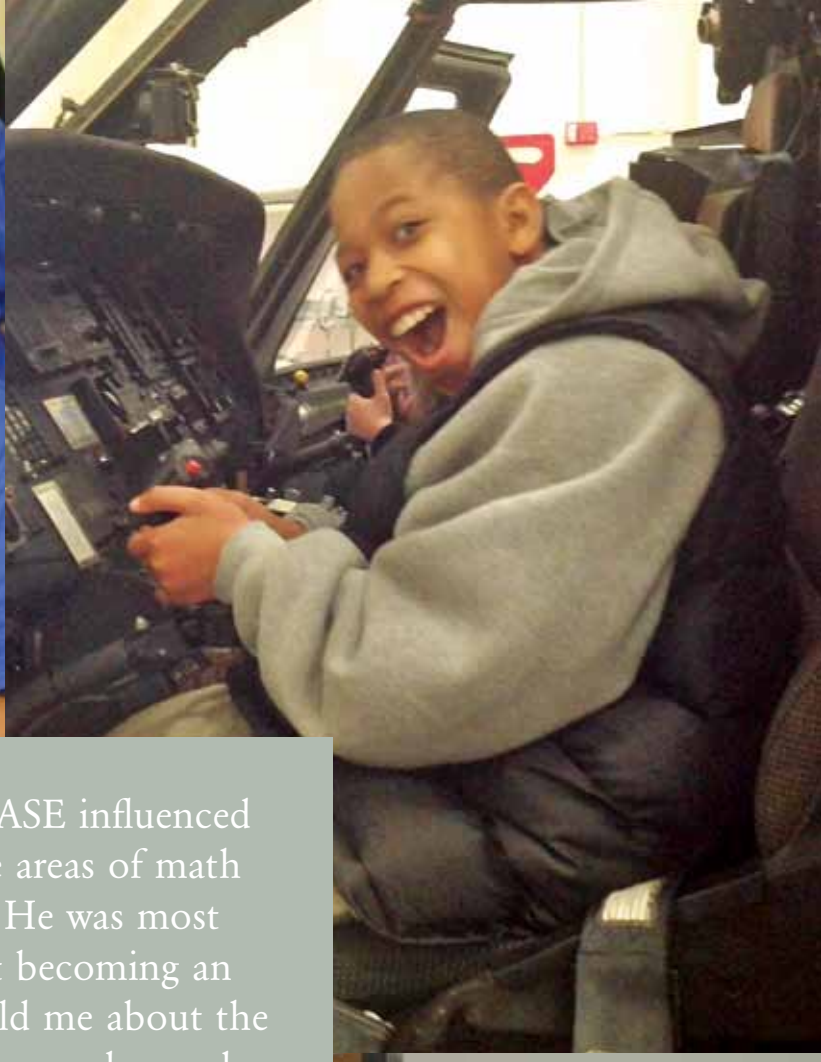
DoD STARBASE
A Department of Defense Youth Program

# 2015 ANNUAL REPORT

THE DEPARTMENT OF DEFENSE
IS MAKING A DIFFERENCE IN
STEM EDUCATION.

"DoD STARBASE influenced my son in the areas of math and science. He was most excited about becoming an engineer. He told me about the computer program he used to make 3D models and really liked it."

Parent of a student at DoD STARBASE California, Sacramento, CA

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"After DoD STARBASE my students are making interdisciplinary connections in class, pointing out physical changes. They were exposed to various careers in STEM and look forward to working hard to become engineers."

Leslie Villasenor, Teacher participating at DoD STARBASE, Los Alamitos, Los Alamitos, CA

# Vision and Mission Statements of DoD STARBASE

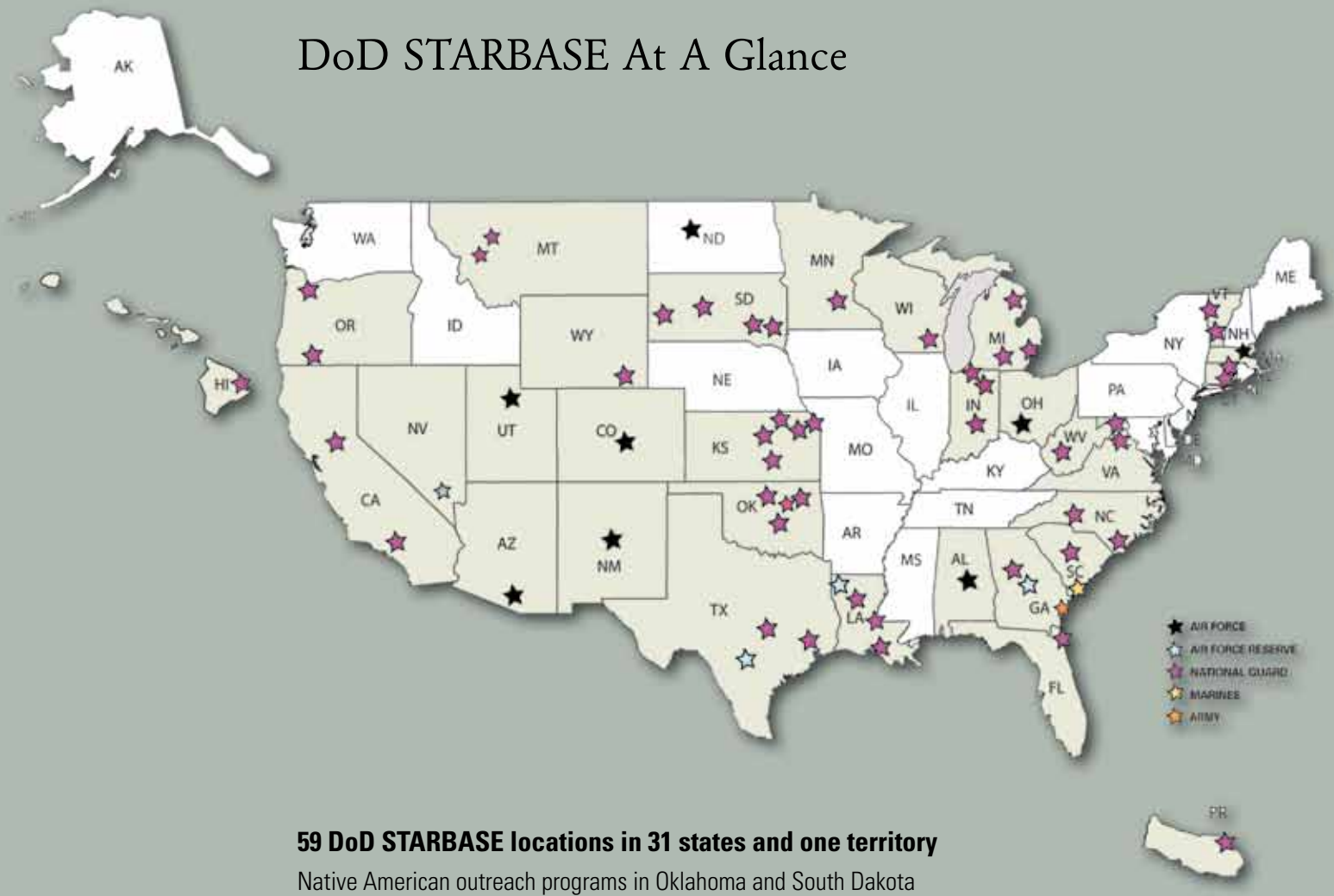
## Vision Statement

To be the premier Department of Defense youth outreach program for raising the interest in learning and improving the knowledge and skills of our nation's at risk youth so that we may develop a highly educated and skilled American workforce who can meet the advance technological requirements of the Department of Defense.

## Mission Statement

To expose our nation's youth to the technological environments and positive civilian and military role models found on Active, Guard, and Reserve military bases and installations, nurture a winning network of collaborators, and build mutual loyalty within our communities, by providing 25 hours of exemplary hands-on instruction and activities that meet or exceed the National Standards.

# DoD STARBASE At A Glance




**59 DoD STARBASE locations in 31 states and one territory**

Native American outreach programs in Oklahoma and South Dakota

- Number of Students since 1993 .....952,783
- Number of students served in 2015.....62,071
- Cost of program.....$22,500,000
- Average cost per academy.....$387,931

"This program is a dream come true, because it is a group of people who value and respect a child's natural curiosity. This program guides children through constructive discovery and inquiry...."

Connie McWorther, Teacher participating at DoD STARBASE Los Alamitos, Los Alamitos, CA

# DoD STARBASE CURRICULUM

PHYSICS
- A. Newton's Three Laws of Motion
- B. Fluid Mechanics and Aerodynamics

CHEMISTRY SCIENCES
- A. Building Blocks of Matter
- B. Physical and Chemical Changes
- C. Atmospheric Properties

TECHNOLOGY
- A. Innovations
- B. Navigation and Mapping

ENGINEERING
- A. Engineering Design Process (EDP)
- B. 3-D Computer-Aided Design

MATHEMATICS OPERATIONS & APPLICATIONS
- A. Numbers and Number Relationships
- B. Measurement
- C. Geometry
- D. Data Analysis

STEM CAREERS
- A. STEM Careers on Military Facilities
- B. Personal Investigations

**David "Shawn" Canady interning at Proterra, an all-electric bus manufacturing company**

"DoD STARBASE gives my students the ultimate STEM experience. Our fifth grade students look forward to this training every year because they are away from school and they go through the engineering design process all day. They experience success and failure but have the chance to re-design and test again. The staff that works with my students is very professional and caring."

Jodi S. Clark, Principal with participating students at DoD STARBASE Robins, Warner Robins, GA

# A Letter from DoD STARBASE Warner Robbins Graduate, David Shawn Canady

Dear STARBASE Warner Robbins,

I would like to personally give insight on how important DoD STARBASE was for the eventual development of my career path. I attended a local school in Macon, GA and went to DoD STARBASE once a day for about five weeks when I was in the 5th grade (1999-2000). While there, I remember learning about concepts of lift and drag and how it affects the aerodynamics of a wing. In addition to lectures, there were numerous times in which we were able to apply concepts into practical applications. The lessons supplemented the experiments, but also made you think. Critical thinking skills were important to accomplish tasks. One of the many experiments conducted was the creation of an ESTES rocket over the course of a couple of weeks and then firing it off at the completion of the course. I cannot explain how great it felt to be able to design and build something and watch it in action.

DoD STARBASE allowed for the development of my critical thinking, time management, and teamwork skills. The most important point of DoD STARBASE though, was first-hand insight on the Science, Technology, Engineering, and Mathematics (STEM) field.

**David "Shawn" Canady currently attends Clemson University majoring in Electrical Engineering.**

In 2008, I enlisted in the United States Marine Corps as an "engineer and electrical equipment systems technician". During my four-year enlistment, I was stationed in North Carolina and Okinawa, Japan and deployed to the Philippines and Thailand. During my deployment in the Philippines, we were hit with a super-typhoon, known as Megi. It was during this incident, I assisted and provided for the Filipinos with water and electricity.

In 2011, mainland Japan was hit by a typhoon and we had nuclear reactors go down. As a result, I was a part of the relief effort to aid the Japanese and received a Humanitarian Service Medal for services. Later in 2011, while stationed in North Carolina, I was once again, assisting in the relief of communities when Hurricane Sandy landed. The skills I learned at DoD STARBASE lead to my ability to be so successful with these cases.

Since leaving the military in 2012, I have completed a cooperative education program with Georgia Transmission Corporation, an electrical transmission corporation that deals with high voltage transmission from generation to distribution. I am also currently an intern at Proterra, an all-electric bus manufacturing company. I currently go to school at Clemson University and major in Electrical Engineering.

Learning about STEM and STEM-related fields is of the upmost importance and must be instilled in young individuals. DoD STARBASE allows for students to learn more about fields that they may not have had an interest in prior. DoD STARBASE provides opportunities to students that they may not have.

Respectfully,
David Shawn Canady

# An Issue of National Importance & National Security

There is an urgent need to establish unparalleled student achievement in science, technology, engineering and mathematics (STEM) curricula at every level of education. From elementary-age students to the young scholars in our nation's high school advanced placement classes and beyond, we must work to make STEM education and careers a rewarding and attractive option to develop the talent and increase the prospective return on investment. American defense and homeland security industries face serious challenges in filling some of the best and most critical technical jobs in our country, and we are not producing enough graduates trained in STEM who qualify for security clearances. The problem presents a serious risk for our national security over the next decade as Baby Boomers retire without an employable talent pool or pipeline to replace them.

The DoD STARBASE program directly supports the Department of Defense Science, Technology, Engineering and Mathematics (STEM) FY2016 - FY2020 Strategic Plan's vision, mission and goals serving as a foundational awareness and workforce development program that highlights STEM awareness as a core component. It is one of the primary tools that the DoD has in its inventory to contribute to the ongoing, renewed national effort intended to close the serious achievement gap with competing nations and to perpetuate our long-term security and prosperity.

DoD STARBASE has a tremendous impact on America's youth nationwide as it improves their learning experience and desire to pursue careers in STEM. Their interests and knowledge in STEM are important to our nation's future as we need to build and sustain a highly educated and skilled workforce capable of meeting the advanced technological requirements of the Department of Defense. Evidence based evaluations of DoD STARBASE participants show significant improvement in the students' understanding, interest, and ability in math and science which has led to increased enthusiasm in pursuing further STEM education. The surveys also find that the vast majority of teachers believe that DoD STARBASE assists in meeting state education standards (for science and mathematics curriculum and testing) and that the teachers are more likely to adopt DoD STARBASE materials.

A rigorous study conducted by Wilder Research on activities at DoD STARBASE Minnesota suggests possible long-term program impacts on students' high school graduation, college enrollment, interest level in STEM areas, and technology in particular. Although students spend only a brief time at DoD STARBASE (25 contact hours), surveys completed by students and teachers both report increased levels of confidence and enthusiasm at the end of the program. Results also indicate that former students have very positive feelings about the program and the military even a decade later.

DoD STARBASE is an outstanding outreach program. It strengthens the relationships between the military, the community (including our industrial partners) and the school districts, while raising the interest of students traditionally underrepresented in STEM education programs and pursuing such careers. With 59 programs nationwide, DoD STARBASE program directors and their respective senior leadership are able to work directly with local and state leaders to execute our DoD STEM Strategy while addressing their educational gaps in STEM using a proven curriculum.

Since its inception in 1993, the DoD STARBASE program has served over 900,000 students from 400 school districts in over 40 states. Through continued annual analysis, evaluations and updates, DoD STARBASE can assist the DoD in achieving its goal of enhancing the efficiency and effectiveness of STEM education initiatives. As a foundational STEM program, DoD STARBASE has the great potential to increase the quantity and quality of scientists, technologists, engineers, and mathematicians graduating from our education system with an interest in supporting our national security. This annual report provides the analysis and information on the program's continued success during FY 2015.

"My son has been waiting since 2nd grade to attend DoD STARBASE. It finally happened this week, and I'm surprised he came home! A very big Thank You to all who made this one of the most memorable weeks "Mustard" has had! You are all inspiring the future and doing a great job!"

Parent of a student at DoD STARBASE Winchester, Winchester, VA

# A Letter from Lieutenant General James Jackson, Chief of Air Force Reserve

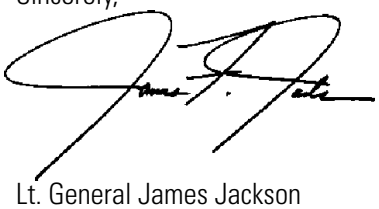
Since 1996, Air Force Reserve Command has been a proud sponsor of DoD STARBASE Robins. This premier DoD educational program offers hands on activities that focus on science, technology, engineering and math (STEM) programs designed to foster innovation and encourage discovery in local youths. Students engage in hands-on activities that not only provide an enhanced STEM experience, but create a learning environment that supports Georgia Performance Standards. To date, DoD STARBASE Robins has provided STEM curriculum enrichment to over 20,000 students in Middle Georgia.

DoD STARBASE Robins' vision is to raise interest and improve knowledge and skills of STEM fields of study to disadvantaged and underrepresented students. Since its inception, average student program test scores have increased 22%. The implementation of DoD STARBASE 2.0 has provided afterschool instruction and mentorship for at risk students as they transition between elementary and middle school. DoD STARBASE 2.0 and the Afterschool Mentoring Clubs have also encouraged our military personnel to become involved in the community we serve.

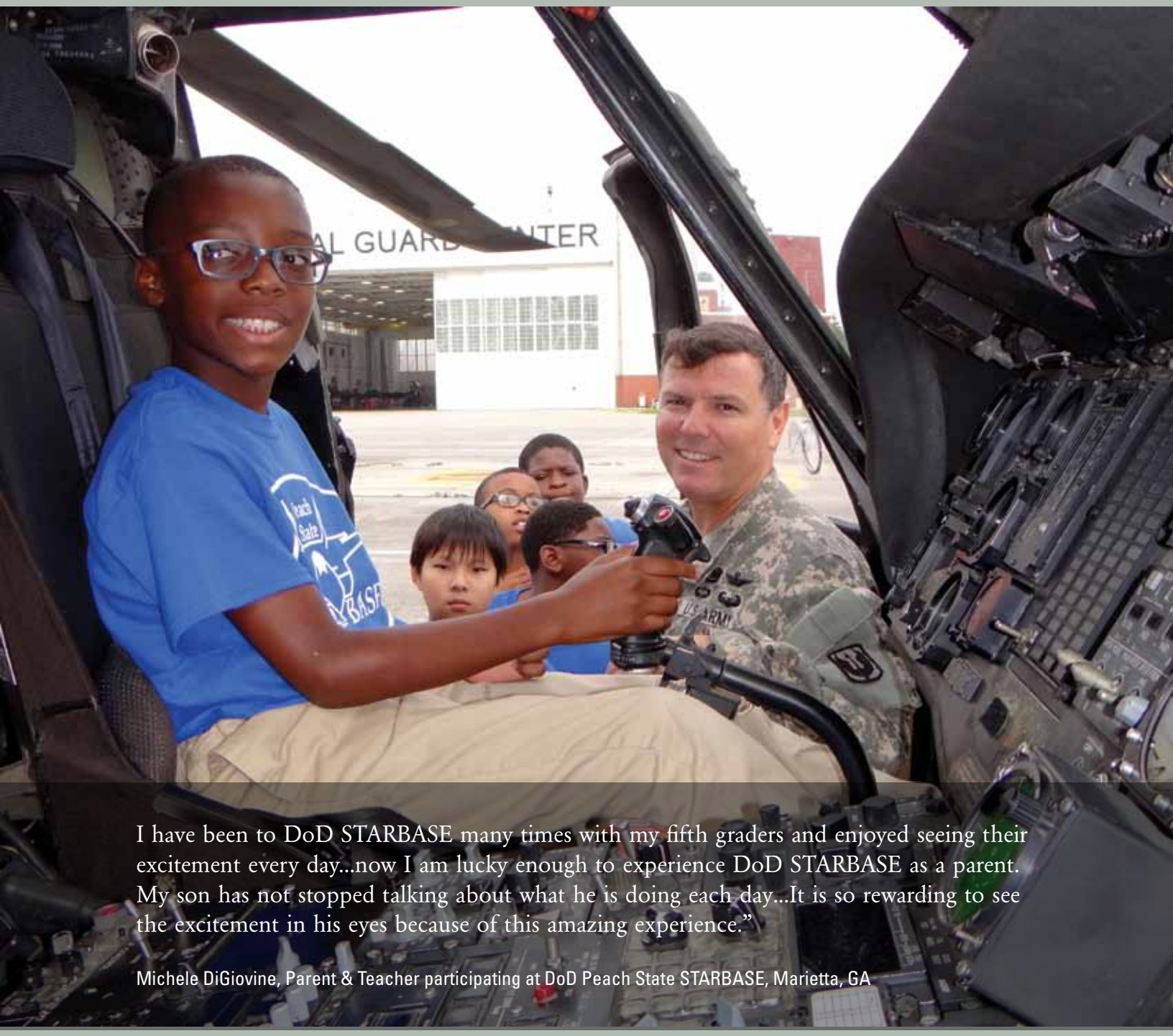
Although the focus of DoD STARBASE Robins is to offer state of the art STEM learning opportunities, it also includes curriculum that encourages personal growth among the participants. Students receive instruction in communication, problem solving, decision making and career goal setting, all of which are essential skills for future success. The faculty also challenges students to give back to their community by planning and implementing service projects in the local area.

One of the benefits of DoD STARBASE Robins is the network of partnerships with industry, government, school districts, and the military which has created a critical community of stakeholders to provide formal and informal STEM opportunities for our youth. It is essential to continue to support such innovative and effective STEM educational programs. It is my hope that DoD STARBASE will become the springboard for future innovators.

Sincerely,



Lt. General James Jackson
Chief of Air Force Reserve
Commander, AFRC



I have been to DoD STARBASE many times with my fifth graders and enjoyed seeing their excitement every day...now I am lucky enough to experience DoD STARBASE as a parent. My son has not stopped talking about what he is doing each day...It is so rewarding to see the excitement in his eyes because of this amazing experience."

Michele DiGiovine, Parent & Teacher participating at DoD Peach State STARBASE, Marietta, GA

**"Providing more highly trained, highly skilled workers to Oklahoma business and industry is essential to boosting state prosperity and creating more jobs,"**
**–Gov. Mary Fallin**

"The students are definitely exposed to many more concepts than they would receive with our regular classroom curriculum. It is so fun to see their faces light up when they make discoveries and science connections!"

Teacher participating at DoD STARBASE Oklahoma - Tulsa, Tulsa, OK

# DoD STARBASE Oklahoma Receives Education Funding from Oklahoma's Aeronautics Commission

The Oklahoma Aeronautics Commission has approved $28,500 in aerospace and aviation education funding that will be distributed to DoD STARBASE Oklahoma whose classrooms are located in Tulsa, Midwest City, Lawton, and Burns Flat. DoD STARBASE Oklahoma has been one of the Commission's biggest and longest-running recipients for education funding, garnering almost $450,000 in grants and contracts since FY 2001.

The funding is part of more than $200,000 the commission is providing over the next 12 months to programs statewide aimed at exposing more Oklahoma young people to STEM and careers in the aviation and aerospace industry. The Aeronautics Commission's aerospace and aviation education funding supports Gov. Mary Fallin's Oklahoma Works initiative that aims to address the skills gap in the state's workforce by increasing the number of students in the state with workforce credentials or associate degrees. "Providing more highly trained, highly skilled workers to Oklahoma business and industry is essential to boosting state prosperity and creating more jobs," Gov. Fallin said. "I am excited to see the Aeronautics Commission's support of Oklahoma Works and our efforts to get Oklahomans the skills and educational opportunities they need to find great careers."

Aeronautics Commission Director Vic Bird said, "It's no secret that our state's aerospace industry – one of our state's top economic engines – needs more skilled workers, especially as our workforce approaches retirement age. These worthwhile programs receiving state funding are doing their part to help make sure that that happens. So we are more than happy to join them in that endeavor." Aerospace and aviation education is one of the Aeronautics Commission's top priorities. Since FY 2001, it has provided $2.3 million in aerospace and education funding to organizations and programs throughout the state. Just within the last 5 years alone, the Commission has awarded nearly $1 million in education grants and contracts.

DoD STARBASE Oklahoma will receive $28,500 in funding from the Commission that will be applied to the organization's STEM Above the Earth program, which serves 5,000 fifth through eighth grade students. According to DoD STARBASE Oklahoma Director Pamela Kirk, the education funds from the Aeronautics Commission will go toward the printing of activity logs for all fifth-grade students in the program and other items, including radio-controlled planes and rockets.

# A Letter from L. John MacMartin, President of Minot Area Chamber of Commerce, North Dakota

Sometime in 2006, the spouses of both Wing Commanders at Minot Air Force Base requested a meeting with me and the Chair of the Board of the Chamber. Their topic of conversation was DoD STARBASE, and I quickly learned that DoD STARBASE was all about STEM programs.

DoD STARBASE is a program that hopefully would light a fire in the hearts and minds of the 5th grade students that took part in it. It could show them how science, technology, engineering and math were applicable in the everyday world. The fact that Minot Air Force Base was near the town and that the airmen would help to teach components of the classes was the icing on the cake.

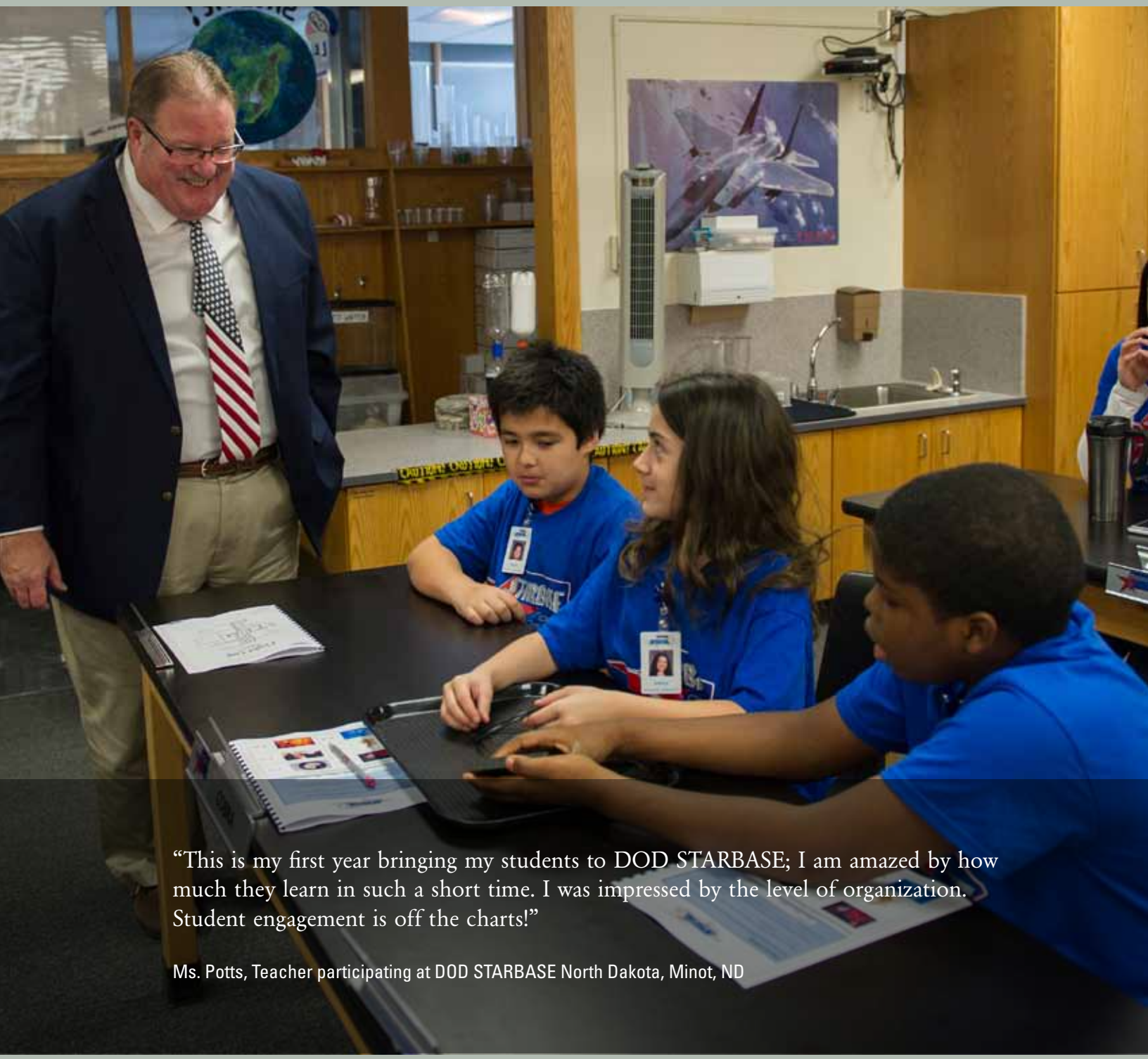
The path to get Minot DoD STARBASE started was not without hurdles to overcome. Suffice to say that we leapt over each hurdle and soon the big day arrived. The entire Congressional Delegation was there, the Mayor, the Minot Superintendent of Schools, the Wing Commanders and their spouses and many other dignitaries. A ribbon was cut, and Minot had a DoD STARBASE program.

The Minot DoD STARBASE program has served 5th grade students within about an hour's drive from Minot Air Force Base, and it has been well received. The advent of the congressional continuing resolutions and the threatened shut down of the federal government did put a hiccup into the continuity of the DoD STARBASE here in Minot. The reality was we lost a year's worth of program operations and over 540 students missed a fabulous opportunity to be exposed to STEM through Minot DoD STARBASE. The new reality is that all parties to the program wanted to see it restarted and to succeed long term. I am pleased to report that DoD STARBASE in Minot is back up, running, and challenging the 5th grade youth of our area.

The Minot Area Chamber of Commerce is pleased to have been part of the start of the program and is even more pleased to have helped push to get the right answers to restart the program this year.

Sincerely,

L. John MacMartin,
CCE President



"This is my first year bringing my students to DOD STARBASE; I am amazed by how much they learn in such a short time. I was impressed by the level of organization. Student engagement is off the charts!"

Ms. Potts, Teacher participating at DOD STARBASE North Dakota, Minot, ND

# DoD STARBASE Collaborations, Creating Community Partners

## Winchester DoD STARBASE Academy Builds Community Involvement

Community involvement has been paramount to the success of the Winchester DoD STARBASE program since they opened their doors in 2012. A vital part of youth education is to see the relevance of their education outside the walls of their classroom. While at Winchester DoD STARBASE, students have the opportunity to interact with guest speakers from a myriad of STEM backgrounds.

Medical careers, such as podiatry, veterinary, and radiology were highlighted during FY 2015. Dr. Lisa Zerull (PhD, RN) from Winchester Medical Center led students through a lesson about the importance of cardiovascular health, and then allowed them to explore the structure of pig hearts, which are comparable to the structure of a human heart. Dr. Zerull stated, "With DoD STARBASE, these impressionable young people receive a comprehensive program that reveals phenomenal career paths that students have never heard about and provide access to professionals and skilled persons like no other program."

Engineers were represented through the Army Corps of Engineers, Winchester City, and Alpha Corporation. Students learned the importance of caring for groundwater systems as well as how to design and build bridges, catapults, and towers. The use of forensic science and technology was emphasized by exposure to law enforcement careers. Police officers taught students how to dust for and lift fingerprints, what Kevlar is made of, how to use a radar device to clock a speeding car, and illustrated the sensitivity of a breathalyzer with hand sanitizer.


Lilly Schutz, a 5th grader from Gainesboro Elementary is learning how to fingerprint with guest speakers Detectives Smith and Barlow while attending DoD STARBASE Winchester.

Retired Air Force pilots taught students how to map four legs of a cross country flight using math to determine heading, distance, and flying time while explaining how STEM is used in the aerospace industry. "The impact that DoD STARBASE has on these future leaders is incredible and will pay great dividends" said Lt. Col. Charles Beck (USAF, Ret.) and volunteer from Northrup Grumman. Another Air Force retiree, Lt. Col. Sam Finch stated, "I feel it is essential for National Security that we have STEM programs to encourage and develop the next generation of scientists and engineers."

Students from Burns Flat/Dill City Elementary learning about a C-130 during their week at DoD STARBASE Burns Flat.

It is through this strong community support that children from the Winchester region are discovering the large variety of STEM careers that exist around our country and are available to them as part of a vibrant community.

## Western Oklahoma Partnership Embraces the Future Generation

Burns Flat is a community of 2,063 residents, located off I-40 in western Oklahoma. What might be considered Burns Flat's newest "claim to fame" is the exciting partnership being formed by military, industry, hobbyist and educational entities to lend their own passions and expertise to their DoD STARBASE Oklahoma classroom. Leaders from the Oklahoma National Guard, Oklahoma Space Industry Development Authority (OSIDA), Western Technology Center (Burns Flat and Sayre campuses), Canute Public Schools, Elk City Flying Aces Radio-Controlled Flying Club as well as the men and women of Altus AFB have come together to nurture the students who participate in the program.

The Oklahoma National Guard began hosting the DoD STARBASE program in 1993, and the Burns Flat location opened in 2006. In 2014, DoD STARBASE-OSIDA partnered with Altus AFB (some 55 miles down the road) to offer a culminating "6th Day" of program offering in the form of a military Career Day. Four to six times each school year, all the classes who have come to the Burns Flat DoD STARBASE classroom for the five days of DoD STARBASE curriculum will jump on school buses once again to tour "all things STEM". There, the students have an opportunity to visit with 50 or more airmen who have created hands-on displays to show the children what they do each day and how it relates to STEM; whether it's the environmental lady with her "skunk traps", logistics, surveyors, hazmat and firemen, cyberspace and base networking, or weather team, the students meet and talk with all of them. Outside, the civil engineers and their heavy equipment are on display,

*Continued on next page*

# DoD STARBASE Collaborations, Creating Community Partners (Continued)

and pilots take these excited youngsters on tours of their aircraft.

Another partnership was launched in 2014-15 with Western Technology Center (WTC) – Burns Flat Campus. Under the leadership of Assistant Superintendent Penny Berry and Counselor Cheri Lu Gastineau, Western has reached out in marvelous ways to the children of DoD STARBASE Oklahoma. As Western learned more about the DoD STARBASE program, they wanted to become a supporter and did so by enhancing "5th Day Graduation" ceremonies. At the WTC auditorium, the WTC staff recognizes the DoD STARBASE students, their culinary program provides cookies and drinks, and students are taken on a tour of WTC STEM programs. At each of these "graduations", a boy and girl "STEM Star" are recognized for their achievement during the DoD STARBASE classes. At year's end, WTC invites these students, their families, their teachers and administrators to return for an evening's "STEM Star Night" where students receive more formal recognition for their achievement in DoD STARBASE.

In addition to the 5th grade programming, DoD STARBASE Burns Flat staff sponsors one of the longest-running and most successful DoD STARBASE 2.0 after-school programs at Canute Middle School. Canute's 2.0 STEM activities have included CO2 dragsters, water bottle rockets, solar-powered cars and will soon add LEGO Mindstorms robotics to its resume. Last spring, Canute students were able to construct radio-controlled airplanes and with the help of the Elk City Flying Aces Radio-Control Club, learned how to fly their craft. Very proudly—and with many, many thanks to the Flying Aces for their guidance—students experienced a near 100% success rate in flying AND landing safely. Twice a year, teachers and students from WTC STEM programs (Biomedical Technology at Burns Flat campus and Criminal Forensics at Sayre campus) bring exciting and interesting hands-on activities to share with the students about their unique programs, allowing students to dissect sheep brains and dust for fingerprints while talking with professionals in these fields.

## STEM Learning and Language Acquisition at DoD STARBASE Hanscom

For the past two years, DoD STARBASE Hanscom AFB provided summer STEM programming to English Language Learners (ELL) in response to the needs of Massachusetts school districts. The performance gap between ELL and native speakers of English is well-documented. Teachers qualified to teach English as a Second Language (ESL) and STEM are in short supply, and school districts are sometimes forced to prioritize language acquisition over STEM learning.

The DoD STARBASE Hanscom AFB summer program seeks to leverage both the language skills and STEM knowledge of ELL through engagement in STEM activities. Multilingual military volunteers from the base serve as inspirational speakers. For five challenging and fun days, students work together in teams and, with assistance from instructors, find a common vocabulary in STEM.

Students from the Leominster Public Schools attend DoD STARBASE during the year, and the ELL DoD STARBASE summer program provided them an additional means of supporting students in STEM along with a grant from Northrup Grumman to the Leominster Education Foundation. The grant defrayed the cost of transporting the students to the DoD STARBASE site at Hanscom AFB.


DoD STARBASE Hanscom's English Language Learners are busy engineering their bridge to test various mass capacity during a summer program supported by Northrup Grumman.

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# DoD STARBASE Collaborations, Creating Community Partners (Continued)

## DoD STARBASE Minnesota – Collaboration with Corporate Partners

The Twin Cities is home to nearly 20 Fortune 500 companies, including 3M, Ecolab, General Mills, St. Jude Medical and Xcel Energy, who, along with hundreds of other companies that make up the local economy, have their sights on the next generation of scientists, engineers and innovators. DoD STARBASE Minnesota partners with many of these corporations to bridge the excitement students experience at DoD STARBASE with actual careers in STEM industries that one day could be theirs.

In the 3M sponsored "Wings & Dreams" room, students peer into the cavities of the pig hearts as Stephanie Board, Senior Microbiologist at St. Jude Medical, discusses the anatomical challenges in designing solutions to treat conditions that affect the human heart.

In the "Rockets" classroom sponsored by BAE Systems, Ken Tillges, BAE Technical Imaging Specialist, fascinates students with a high speed camera that he uses to make engineering design decisions. Next door, fellow engineers Teren Van Zuilen and Chuck Madhav teach students about energy conversion using a potato that acts as a battery to power LED lights.

Xcel Energy volunteers conduct an interactive demo on how to harness energy from the wind and sun and distribute it to homes in the community. On the other side of the room, 3M Research Specialist Terri Shefelbine provides insight to the world of research and cross-linking polymers in the development of products. And, under the shadow of the Stratasys-donated 3D rocket, with its 700 hours of layered plastic and Creo-designed parts, Amy Sissala, Stratasys R & D Applications Engineer, demonstrates applications of 3D printing on missions to space.

To simulate what happens in Seagate's clean room, Daniel Sullivan, from Seagate, had DoD STARBASE Minnesota students dress in clean suits before inspecting disk drives.

In FY 2015, over 100 local scientists and engineers from partnering STEM corporations volunteered over 250 hours to DoD STARBASE Minnesota. "I started volunteering for STARBASE because of how much fun it is sharing science with kids and getting them excited about potential career paths down the road", said Max Gelderman, Senior Chemist at Ecolab. "I really enjoyed doing these experiments when I was younger, and it helped direct me towards my field of study." As colleague and Senior Microbiologist, Amanda Wessinger added, "It's important for young people to be exposed to multiple aspects of STEM, especially to see real life scientists performing something they do in their every day job. It is good to help youth realize that

science can be fun and, especially, that women can be involved."

In addition to time, talent and classroom sponsorship, many corporate partners have deepened their involvement even further by donating much needed products and services to DoD STARBASE Minnesota's programs. Microsoft donated software, while Delta Air Lines printed flight logs. Others, like 3M, provided equipment and film for classroom walls. Quantum Technologies' donated a high speed camera, and Stratasys' provided 3D printing material. Boston Scientific sponsored the "Nanorobotics" classroom and has also been a significant financial contributor to DoD STARBASE Minnesota's STEM Pathways program, which collaborates with five other Twin Cities' STEM education organizations to promote long term STEM learning for a more illuminated path to future STEM careers.

DoD STARBASE Minnesota's Board of Directors member Jeffrey Matthews, Executive Director of partner Cummings Power Global Engineering, stated, "Ensuring a robust pipeline of STEM talent at Cummins Power is critical to our future success. Programs like DoD STARBASE not only raise STEM awareness, but also ignite a passion for STEM in our country's next generation of employees. I am a DoD STARBASE board member because I've seen first-hand the impact that this program has on our future."

Led by Alex Dietz of St. Jude Medical, DoD STARBASE Minnesota students made their own color-changing LED throwie using coin cell batteries and discrete LEDs. They then reverse engineered an infinity mirror to see how their single LED throwie was multiplied using a mirror and a half mirror in a box, gaining a greater understanding of the principles of partial reflection.


Major General Timothy P. Williams, the Adjutant General of Virginia, visited John Kerry Elementary School students taking part in activities at the Winchester DoD STARBASE Academy, located at the Cherry-Beasley Readiness Center in Winchester, Va. The hands-on activities for the day included completing an electrical circuit, programing robots, and structural engineering.

# A Letter from Major General Timothy P. Williams, The Adjutant General of Virginia

The Winchester DoD STARBASE Program has been a huge success and made an incredible impact on STEM education for students in the region. In the past year, the DoD STARBASE staff has exceeded the required 28 weeks of instruction and provided 35 weeks that reached more than 730 students. Of those students, more than 70% came from Title I schools with at-risk populations, English was the second language for 9% of the students and 51% of the students were female. Students who attend the Winchester DoD STARBASE Program average a 30-point increase between the pre-test on the first day and the post-test on fifth and final day of instruction.

The outreach program by the Winchester DoD STARBASE staff further increases the impact and has reached another 400 students. Our staff participates in STEM nights at school, conducts special single day training programs and teaches lessons at our own Youth Camp and Commonwealth ChalleNGe program for at-risk teens.

Our faculty has become widely recognized for their expertise in instruction methods and techniques for STEM education. They were invited to teach a professional development program on "Inquiry-based learning, science best practices" to elementary teachers in Clarke County, Va.

The faculty has also taken advantage of the many subject matter experts in the area and brought them in as guest speakers for each class. These guest speakers included a retired Air Force pilot, retired Air Force engineer, Army Corps of Engineers, a veterinarian, a doctor, a civil engineer, a police detective and health care representatives. The program also has formed a great partnership with the Virginia National Guard Soldiers at the Cherry-Beasley Readiness Center where they teach the DoD STARBASE classes. Soldiers provide facilities tours, talk about their military service and the types of careers offered by the military.

I could not be more proud of the quality of instruction, the professionalism of the staff and their dedication to promoting STEM education to the students in the area. I hope every effort is made to continue to fund this program for many years to come.

Sincerely,

Timothy P. Williams
Major General, The Adjutant General of Virginia

# A Letter from Dr. Jada Pitman, Executive Director Student & Outreach Services, Southwest Independent School District

It is with deep gratitude that I thank DoD STARBASE Kelly for the reverberating positive impact they have on thousands of students in Southwest Independent School District (SWISD). Our partnership with DoD STARBASE Kelly started in February 1993 when it was introduced at Sky Harbour Elementary School. Since then, several other campuses within SWISD have participated. Historically, 134 classes have participated in DoD STARBASE Kelly. Each class consists of 25 students, which means the impact is wide and greatly valued, influencing more than 3,350 students.

DoD STARBASE learning is high interest, hands on engagement led by teachers and staff who have genuine interest in leading science, technology, engineering and math (STEM) learning, inquiry, understanding, and enjoyment. These lessons cannot happen in a regular elementary classroom due to location, experiment possibilities, access to equipment, programs, and personnel (former astronauts, pilots, etc.). Aspirations are ignited for what students want to do and who they want to become as adults.

This year we had a former DoD STARBASE student from 1998 participating with her class. She is a teacher working alongside the DoD STARBASE staff guiding her students and continuing the high impact of a quality STEM program that leaves indelible marks.

DoD STARBASE Kelly continues to change the face and future of our nation through awakening STEM leadership within the young. Our students are pursuing higher education and careers in the sciences. DoD STARBASE Kelly is a spark that ignites motivation, successes, and plans for tomorrow.

On behalf of our students, teachers, and staff, thank you for bringing this quality program to SWISD. We are blessed by many years and many lives this program has molded and improved. Thank you for both your insight and foresight.

It is our greatest hope that we can continue to lead our students into a positive and productive future.

Sincerely,

J.L. Pitman, Ed.D.
Executive Director Student & Outreach Services
Southwest Independent School District

Lloyd Verstuyft, Ed.D.
Superintendent Southwest Independent
School District

"DoD STARBASE is a wonderful experience for my students; it provides them the opportunity to learn about STEM in a fun, hands-on environment. My students are always excited to tell others back at school what they have learned."

Stacey Brandes, Teacher participating at DoD STARBASE Vermont- Burlington, Burlington, VT

# DoD STARBASE Collaborations with Pre-Service Teachers Helps Build STEM Pipeline


Brianna makes science fun by modeling relaxed engagement with students from Detroit.

## DoD STARBASE One and Oakland University:

As a leading expert in STEM education, DoD STARBASE One at Michigan's Selfridge Air National Guard Base pioneered a new community partnership in 2014 with nearby Oakland University's School of Education. Mark Muzzin, Deputy Director at DoD STARBASE One, spearheaded the partnership, realizing that DoD STARBASE can utilize its more than 22 years of expertise to increase the STEM teaching capacity of future educators. According to Oakland University, only 10% of their elementary teaching graduates over the past three years have pursued and earned a science teaching endorsement. This clearly supports the alarming call of a national shortage of STEM-qualified teachers which is substantiated by participating DoD STARBASE teachers who as often do not possess the confidence, time, or materials to teach science and STEM-related subjects. It seemed only natural then to leverage the pedagogical strengths of DoD STARBASE with the need to increase STEM literacy by empowering the next generation of teachers.

The unique format of DoD STARBASE provides the capacity to demystify and build confidence with STEM instruction and classroom management. It affords an opportunity for authentic, testable teaching experiences in small group settings with repeatable lessons in team-based, co-teaching environments that encourage aspiring teachers to experiment, apply, and reflect on teaching strategies. The novel environment at DoD STARBASE is also inspiring to new teachers, and is a chance to learn real- world teaching in a state-of-the-art facility.

During her four-day DoD STARBASE experience, Oakland University student, Brianna Lewicki, worked with and taught chromatography 14 times to small groups of six to eight students. The repetitive structure allowed Brianna to first observe a DoD STARBASE instructor, then co-teach with the instructor, and conclude with teaching lessons on her own, receiving direct, observable, constructive feedback and coaching from the DoD STARBASE instructor. She could practice teaching STEM subjects in short bursts while being able to redesign her instructional

*Continued on next page*

# DoD STARBASE Collaborations with Pre-Service Teachers Helps Build STEM Pipeline (Continued)

Brianna models and allows for independent practice as students create chromatograms.

methods through each repetition. This encouraged her to experiment and learn from mistakes in the same way attending DoD STARBASE fifth graders learn through problem solving and critical thinking. Education majors, like Brianna, gain tangible strategies and classroom management tools they can apply to teaching STEM concepts–but even more important, their experience imbues them with confidence as STEM instructors.

> *I am more confident now that I know how to adapt to the children's needs. Each group is slightly different but the lesson is the same so I enjoy having the opportunity to tweak my teaching.*
>
> Brianna

As with all healthy relationships, the benefits flow in both directions. Oakland University students bring new energy and ideas with them, infusing fresh air and alternate perspectives. Furthermore, as coaches, it is vital for DoD STARBASE instructors to think critically about every aspect of a lesson and their interactions with and between Oakland students and attending fifth graders. It centers the staff's intention as well as attention, and it creates an opportunity to see the DoD STARBASE lessons through a different lens as a focused observer. This new perspective helps generate subtle, new approaches that strengthen the lessons and their outcomes.

This is only the beginning of the partnership between DoD STARBASE and Oakland University's School of Education. Both sides have a commitment to strengthen and grow the unique and immersive DoD STARBASE/ Oakland University educational outreach initiative

as they meet the call of the Federal STEM Education Strategic Plan to prepare excellent K-12 STEM teachers by 2020. No doubt, with its rich history in STEM education, DoD STARBASE is here to not only meet this call to action, but to exceed it.

## Noyce Science Teacher Intern at DoD STARBASE Hanscom AFB:

For the past two years, DoD STARBASE Hanscom AFB has served as one of eight internship sites for the Robert Noyce Science Teacher Scholars (STS) Program at Bridgewater State University (BSU). The program encourages talented STEM students and professionals to pursue teaching careers in elementary and secondary schools.

Amanda Lane, BSU student, selected DoD STARBASE Hanscom AFB as the site for her four week internship in 2015. Amanda had the opportunity to observe STEM teaching, assist with STEM activities and ask questions about STEM learning. DoD STARBASE instructors provided mentoring and guidance on STEM content and teaching pedagogy.

Interns, such as Amanda, are eligible for scholarships to support their final two years in school–allowing them time to complete STEM courses and obtain teaching credentials. The scholarships fully cover tuition, fees and books for the academic year. After graduation, scholarship recipients attend a mentoring program that provides ongoing support for first year teachers.

A student from Longsjo Middle School testing his straw rocket at DoD STARBASE Hanscom.

# A Letter from Gus Hargett, Major General, USA, (Ret.) President of the National Guard Association of the United States

On behalf of the more than 45,000 members of the National Guard Association of the United States (NGAUS) and the nearly 500,000 soldiers and airmen of the National Guard, I am proud to endorse the Department of Defense STARBASE program.

During our 2015 national conference in Nashville, our membership endorsed by resolution the DoD STARBASE program and its continued funding. DoD STARBASE provides elementary students with real-world applications of math and science through experiential learning, simulations, and experiments in aviation and space-related fields.

DoD STARBASE has a proven track record, teaching children how to set and achieve goals, take positive action in their lives, and build strong self-esteem. It provides to thousands of students opportunities, experiences and knowledge in areas that they might never be exposed to otherwise.

Members of the National Guard that serve as volunteers, teachers and mentors in the many DoD STARBASE programs across the country are very proud of the opportunity DoD STARBASE provides them to help children and their communities.

This partnership between our citizen soldiers and airmen and those young students is one strong example of what our country can do for its children. With the use of minimal federal dollars, the results far outweigh the costs. NGAUS will continue to work hard to see that this program gets the support it needs.

Sincerely,

Gus Hargett
Major General, USA, (Ret.)

DoD STARBASE
A Department of Defense Youth Program

# 2015 DoD STARBASE ASSESSMENT

"I'm very impressed with what is happening at DoD STARBASE and so grateful my daughter has this opportunity. I love the intentional approach to learning and enjoy seeing the military personnel serve and interact with the students."

Candace H., Parent of a student at DoD STARBASE Minnesota, Minneapolis, MN

# 2015 Assessment

## Executive Summary

Section 2193b of the title 10, United States code, authorizes the DoD STARBASE program. The authorizing legislation requires the Secretary of Defense to submit an annual report to Congress on the conduct and effectiveness of the program.

The FY 2015 assessment process obtained information via knowledge and attitudinal tests, structured interviews, questionnaires, program visits, and conversations with program participants. Assessments, interviews, and/or questionnaires were received from 1,254 students, 1,668 teachers, and all DoD STARBASE directors. A brief overview of the assessment highlights some of the key findings of the analysis.

## Highlights

### STUDENT ASSESSMENT

- The academy participation rate in the annual Student Assessment survey was 96%.
- 1,254 students were included in the study, an increase of 13.4% over the previous year.
- Most respondents were in the fifth grade (94%) and between 10–11 years old (93%).
- There were equal proportions (50%) of girls to boys.
- 84% of the attitudinal items improved significantly pre- to post-program; some of the largest shifts occurred in attitudes about STEM, the military, and future careers.
- Performance on knowledge items increased significantly (26%) from pre- to post-program.
- Physics showed the largest curriculum area improvement (increase of 46% in overall points for proper answers).
- Chemistry also showed strong gains, with a 39% improvement.
- Math scores improved substantially, with a 22% gain.
- Military Attitudes–Those entering the program with low military attitudes had lower program knowledge scores, lower knowledge gain scores, and less favorable attitudes for both the pre- and post-program than those entering the program with high military attitudes.
- Knowledge and Experience–Students with prior knowledge of, and experience with, DoD STARBASE responded more favorably to more attitudinal items than those with no prior knowledge or experience.
- Performance–Students identified as high performers scored higher on the pre- and post-knowledge assessment as well as on pre- and post-attitude survey, compared to their lower performing counterparts. The largest gap was on the knowledge assessment where:
  - high performers improved by 8.5 points from pre- to post-program assessment, while
  - low performers improved by 4.3 points pre- to post-program.

- Gender–Although boys' attitude scores were significantly more positive than girls' on the pre-program assessment, the gap was reduced by 20% in the post-program assessment. Boys and girls did not significantly differ on 22 of the 31 post-program items measuring favorable attitudes toward STEM and the DoD STARBASE program, although boys displayed more positive attitudes than girls on 14 of those items. Similarly, boys' scores on the pre-program knowledge assessment also significantly exceeded that of girls, but girls showed strong gains during the program and that difference was insignificant by the post-program assessment of knowledge.
- Age–Increased student age correlates positively with liking science and technology and favorable attitudes toward the military. Older students might thus serve as positive role models for younger students, and therefore might be encouraged to participate in collaborative learning with them.

## TEACHER ASSESSMENT

- 88% (1,475) of the teachers reported that they are more aware of career opportunities (both uniformed and non-uniformed civilian) within the Department of Defense because of their participation in the DoD STARBASE program.
- 99% (1,658) of the teachers will recommend DoD STARBASE to other teachers, principals, or school educators.
- A 26% increase in recommending the DoD or the military as a career option to students occured after participating in the DoD STARBASE program (67% Very or Extremely Likely post-program versus 41% Very or Extremely Likely pre-program).
- Teachers reporting higher levels of support (e.g., resources provided by DoD STARBASE) responded more favorably to the attitudinal items as compared to those indicating having less support.
- The majority of teachers (81%) did not major or minor in a STEM-related discipline and reported less confidence in teaching STEM-related topics compared to teachers with a STEM-related major or minor.

## DIRECTORS' QUESTIONNAIRE

### *DoD STARBASE Program*

- DoD STARBASE programs are located at a variety of military installations including: Air Force (8 locations), Air Force Reserve (4 locations), Army (1 location), National Guard (45 locations), and Marine Corps (1 location) sites.
- The DoD STARBASE program conducted 2,623 classes serving 1,096 schools across the country in 366 school districts. Of the schools participating in the program, 72% were Title 1 eligible schools.
- The majority of the DoD STARBASE locations (88%) serve school districts within a 50-mile radius of their program site.

*Continued on next page*

## Executive Summary (Continued)

- Over 62,000 students attended the five-day program in FY 2015. The majority of DoD STARBASE students (88%) are fifth graders.
- Males outnumber female students 51% to 49% respectively.
- The average instructor to student ratio for FY 2015 was 1:14.
- The average class size for FY 2015 was 24 students.
- The non-Hispanic or Latino, Black or African American, and White student populations are the predominate participant groups at 80%, 19%, and 57% respectively.
- The percentage of American Indian or Alaskan Native, Black or African American, and Hawaiian Native or Pacific Islander participant population is higher at DoD STARBASE than at U.S. public schools.
- Contractor affiliations made up the majority (53%) of the DoD STARBASE employment relationships followed by state and federal affiliations at 46% and 1%, respectively.
- In an effort to serve more students, 49 locations have made modifications to the prototype staffing model (a director, a deputy director/instructor, an instructor, and an office manager/administrative assistant) to include additional instructional and classroom support staff.
- There was a 16% increase in the number of employees from FY 2014.
- The overall turnover rate for FY 2015 is 21%, including 55 staff departures.
  - The majority (33 departures) were at the instructor level. Office Managers were the next highest with seven departures followed by teaching assistants at five departures.
  - Directors reported that of those staff members who left the program, 17% indicated the reason for their decision to leave DoD STARBASE was because of a better opportunity at another academic institution. Others stated program funding uncertainty (15%), personal reasons (13%), and better financial opportunities (11%) for their decision to leave.
  - Of these positions, 10 remained unfilled at the end of FY 2015.
- The DoD STARBASE locations documented a total 8,051 volunteers who contributed a total of 188,846 hours to the program during FY 2015.
- Many DoD STARBASE locations (60%) reported they have relationships with nearby teacher colleges or training programs where student teachers may obtain practicum hours at DoD STARBASE. At the STARBASE locations that offer teacher training, 70% of the teachers may use this training towards their certification requirements.
- 72% of the DoD STARBASE locations report that they have relationships with other outreach programs in their area including: FIRST LEGO League, Civil Air Patrol, Girl Scouts and Boy Scouts.
- The average operating cost per location was $387,931.

DoD STARBASE 2.0 Program

- In FY 2015, 20 DoD STARBASE locations in 19 states reported coordinating a total of 41 DoD STARBASE 2.0 programs with five additional DoD STARBASE locations coordinating new 2.0 programs.
- 31 school districts and 40 schools partnered with DoD STARBASE to operate 60 - 2.0 clubs.
- The greatest numbers of 2.0 programs (20 programs and 32 clubs) were sponsored by the National Guard, where the majority of the DoD STARBASE programs are also located.
- The average student retention rate within the 2.0 program was 79%. Of the students who did not complete the program, 33% were females and 67% were males. Directors reported several reasons why students discontinued the program. Moving, time conflicts, and lack of interest in the chosen curriculum are the main reasons why students drop from the program.
- Former DoD STARBASE students made up 60% of the DoD STARBASE 2.0 program participants.
- The 2.0 program participants included 33% females and 67% males.
- The average student attendance at 2.0 club meetings was 14 students.
- There was a 1:4 mentor to student ratio within the 2.0 program.
- The students are mostly 6th and 7th graders (40.1% and 27.1%, respectively) although some are from other grades.
- Most groups of students historically underrepresented in STEM fields (Hispanics and Latinos, American Indian or Alaska Native, and Black or African American) are represented at DoD STARBASE 2.0 which may be due to the positive experience these students encountered at DoD STARBASE, as indicated by attitudinal tests.
- Most mentors are military (36%) or other DoD affiliated professionals (23%).
- Most (50%) of the 20 DoD STARBASE locations coordinating a 2.0 program received funding from both federal and private funds. Four locations reported they do not receive any funds whatsoever to operate a 2.0 program.

Each section of the following report provides an assessment of the program's progress and describes the unanticipated and/or unresolved issues that emerge in program operations. The report is organized as follows:

# DoD STARBASE Program Overview

## The Participants

DoD STARBASE programs operate under the auspices of the Department of Defense (DoD) through the Office of the Assistant Secretary of Defense for Manpower & Reserve Affairs (OASD/M&RA). A Congressional Appropriation to the DoD funds the operation of DoD STARBASE. Synergy between the local military base, schools, and surrounding communities enhance and strengthen the program.

During FY 2015 the DoD STARBASE program conducted 2,623 classes serving 1,096 schools across the country in 366 school districts. Over 62,000 students attended the five-day program in FY 2015. These statistics have increased significantly from FY 2014 with a 24% increase in the number of students served, a 20% increase in the number of schools, a 26% increase in classes, and a 19% increase in the number of districts participating in a DoD STARBASE program.

During the summer months many DoD STARBASE locations also offer a variety of supplemental programs to area youth in grades K–12. The number of locations offering supplemental programs increased by 34% from FY 2014 with 38 DoD STARBASE locations offering some type of supplemental program. Supplemental programs provided in FY 2015 include: aerospace education, robotics instruction, and engineering instruction. The number of students served by supplemental programs increased from FY 2014 by 50% to 12,418 youths in FY 2015.

THE MILITARY

The military hosts and supports DoD STARBASE programs[1]. Programs are located at various military installations including: Air Force (8 locations), Air Force Reserve (4 locations), Army (1 location), National Guard (45 locations), and Marine Corps (1 location).

The majority of the DoD STARBASE locations (88%) serve school districts within a 50-mile radius of the programs' duty station. Locations that extend beyond a 50-mile radius generally have made special accommodations to reach more students such as those in the Native American outreach programs. DoD has a wealth of expertise in STEM education and provides the DoD STARBASE locations access to resources and services that most school systems cannot offer. OASD (M&RA) provides state of the art equipment and technology, but military bases provide classroom space, utilities, and security. The base may also provide additional equipment, janitorial services, maintenance, travel services, and IT support. DoD STARBASE operates at the discretion of the base commander who may view this program as a venue for military personnel to positively interface with their community. Military personnel are encouraged to volunteer their time to the program as mentors, expert speakers, tour guides, and other support activities.

Military volunteers inspire students and community engagement in STEM education. They may serve as guest lecturers to explain the use of STEM in different careers and/or act as base tour guides highlighting the application

[1] Most of the academies operate within the confines of a military base. A few operate in an affiliate site contiguous to the military installation but under the property management of the base. Bayou State STARBASE, in Rosedale, Louisiana is currently located at the original Iberville High School because there is not a military installation within 50 miles of a population of Title I students.

of STEM concepts in their missions and giving students access to military facilities and operations. Military volunteers provide unique, informative, and highly varied experiences for the students, which provide an exciting, stimulating environment to enhance their STEM experience.

Students may discuss how chemical fires are extinguished, learn how the injured are transported, and explore the cockpit of an F-18 or the interior of a C-130. The only constant is the excitement the student experiences in the presence of a military volunteer. As volunteers, these hard-working, highly disciplined men and women command respect and honor in their presence and serve as a very powerful force to inspire students to set goals for their own lives. Participating classroom teachers are also inspired and encouraged by the involvement of military volunteers in the DoD STARBASE program.

## THE SCHOOL DISTRICT

Students from local school districts surrounding the host military installation participate in the DoD STARBASE program. DoD STARBASE locations may schedule schools to attend the 25 hour program over five consecutive days or on a weekly basis over five consecutive weeks. About half (52%) of the DoD STARBASE locations use the weekly schedule and 43% of the locations use a consecutive day schedule[2]. In FY 2015, 366 school districts participated in the DoD STARBASE program which is an increase of 19% over FY 2014. Participating schools include schools from Title 1 eligible, public, private, urban, and rural districts (see Table 1).

**Table 1:**
**DoD STARBASE 2015 Participating School Demographics**[3]

| School Type | Number of Schools | Percentage of Total Schools |
|---|---|---|
| Title 1 Eligible | 803 | 73 |
| Public | 930 | 85 |
| Private | 117 | 11 |
| Urban | 821 | 75 |
| Rural | 275 | 25 |
| **Total Schools** | **1,096** | **100** |

Many elementary teachers do not have the time, educational background, and/or resources to cover STEM topics appropriately and simply cannot match the DoD STARBASE experience. School districts enter a formal agreement with the military base hosting the program which may include commitments on availability of students, targeting at-risk children, transportation, student lunches, a designated time of instruction, and providing teachers as monitors. As a result, the school's curriculum is enhanced, and students are better prepared for standardized state testing.

2 The remaining 5% use some other schedule.

3 Numbers shown are for five-day programs and do not include other programs. Some schools may be counted in more than one category. 49 schools were not classified as Public or Private.

THE COMMUNITY

Public and private organizations support and enhance the DoD STARBASE curriculum and operation. Community leaders may volunteer their time by serving on boards, assisting with gaining access to community facilities, and/or raising financial support. They also view the program as benefiting the community by promoting better life choices, problem-solving skills, and future job opportunities. Community leaders identify DoD STARBASE as a mechanism to promote student interest in STEM, facilitate a well-trained STEM workforce, and a STEM-literate public, thereby enhancing the future of their communities.

## The Program Elements of DoD STARBASE

Department of Defense Instruction (DoDI) 1025.7 outlines the guidelines and directives for the DoD STARBASE program. The DoDI covers operational requirements such as budget, desired grade level, class size, scheduling hours, curriculum topics and activities, the desired demographics, documentation requirements, testing, and program location. If a DoD STARBASE director wishes to deviate from the DoDI requirements, he/she must submit a written request to OASD/M&RA.

### *DOD STARBASE STUDENTS*

GRADE LEVEL

The DoD STARBASE program is authorized to serve students in kindergarten through grade twelve. Because of the dramatic decline in math and science performance by U.S. students after the fourth grade, the DoD STARBASE curriculum and standards are developed for the fifth grade level. Some locations (23) receive students in other grade levels in addition to the fifth grade, but most DoD STARBASE students are fifth graders (88%). Table 2 (page 39) shows the number of students at each grade level. The total number of students served in FY 2015 was 62,071. This is a 24% increase over FY 2014 which may be due to the increase in DoD STARBASE staffing and decrease in turnover enabling DoD STARBASE locations to begin operations in line with the participating schools' calendar.

**Table 2:**
**Grade Level of FY 2015 DoD STARBASE Students**

| Grade Level | Number of Students |
|---|---|
| Kindergarten through 3rd Grade | 0 |
| 4th Grade | 3,324 |
| 5th Grade | 54,887 |
| 6th Grade | 3,793 |
| 7th Grade and Above | 67 |
| **Total Number of Students** | **62,071** |

## CLASS SIZE

Smaller class size is particularly important to the inquiry-based instruction used at DoD STARBASE locations. The DoDI requires two DoD STARBASE teachers per class or an average DoD STARBASE instructor to student ratio of 1:15, with 20-35 students as acceptable class sizes. The average instructor to student ratio for the FY 2015 program year was 1:14. The average class size for the FY 2015 program year was 24 students. Three locations reported averages below 20 students[4]. The highest reported average class size was 30 students.

Classroom size has decreased in public schools across the country and many STARBASE locations have increased their efforts to service more students by opening additional STARBASE classrooms so that classes may operate simultaneously. Additional DoD STARBASE classrooms allow schools to send more students who are then assigned a DoD STARBASE class. Depending on the number of students arriving from the school, the resulting "DoD STARBASE class" may contain students originating from multiple classrooms.

In FY 2015, 34 DoD STARBASE locations operated simultaneous classes ranging from two simultaneous classes to as many as six. On average, DoD STARBASE locations operate two simultaneous classes. The ability to operate simultaneous classes is dependent upon available space and personnel.

## ETHNIC AND RACIAL COMPOSITION

Table 3 (page 41) shows the ethnic and racial composition of the DoD STARBASE student population[5]. The non-Hispanic or Latino, Black or African American, and White student populations are the predominate groups at 80%, 19%, and 57% respectively.

[4] DoD STARBASE sites in Colorado, South Dakota-NOVA, and Minnesota reported averages of less than twenty students.

[5] Five locations (with 7% of the total student population) did not report student ethnicity and/or race: STARBASE Maxwell, STARBASE Alpena, STARBASE Kelly, Texas STARBASE Houston and Wyoming STARBASE Academy.

"You guys run an amazing educational program! My son who is very intelligent, but super quiet, has not stopped talking about all the activities that you have done and the science behind those activities. Now all you need to do is open a school! We would be first in line!"

Tina McCarthy, Parent of a student at DoD STARBASE Waterbury, Waterbury, CT

**Table 3:**
**Ethnicity and Racial Composition of DoD STARBASE Student Population FY 2015**

| Ethnicity | Percentage |
|---|---|
| Hispanic or Latino | 18% |
| Non-Hispanic or Latino | 80% |
| Ethnicity Unknown | 2% |
| Race | |
| American Indian or Alaskan Native | 3% |
| Asian | 4% |
| Black or African American | 19% |
| Hawaiian Native or Pacific Islander | 1% |
| White | 57% |
| More Than One Race | 7% |
| Race Unknown | 9% |

DoD STARBASE programs are located in areas where the need for STEM education is great. Consequently, these neighborhoods contain groups that have been historically underrepresented in STEM fields (Hispanics and Latinos, African Americans, American Indians, Alaska Natives, Native Hawaiians and Pacific Islanders). Figure 1 (page 42) compares these groups in the FY 2015 DoD STARBASE student population and in public and secondary school enrollment (pre-kindergarten through grade twelve) as reported by the U.S Department of Education[6]. The American Indian or Alaskan Native and Black or African American populations are higher at DoD STARBASE than at U.S. public schools. Public school statistics on Hawaiian Native or Pacific Islander populations are not available, but the percentage of DoD STARBASE students compared to the U.S. population of Hawaiian Native or Pacific Islanders is higher at DoD STARBASE (1 %) than in the U.S. population (0.2 %)[7].

[6] U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary and Secondary Education," 2002–03 and 2012–13; and National Elementary and Secondary Enrollment Projection Model, 1972 through 2024. See Digest of Education Statistics 2014, Table 203.5.

[7] United States, "The United States Census Bureau, State & County QuickFacts." Accessed November 6, 2014. http://quickfacts.census.gov/qfd/states/00000.html.

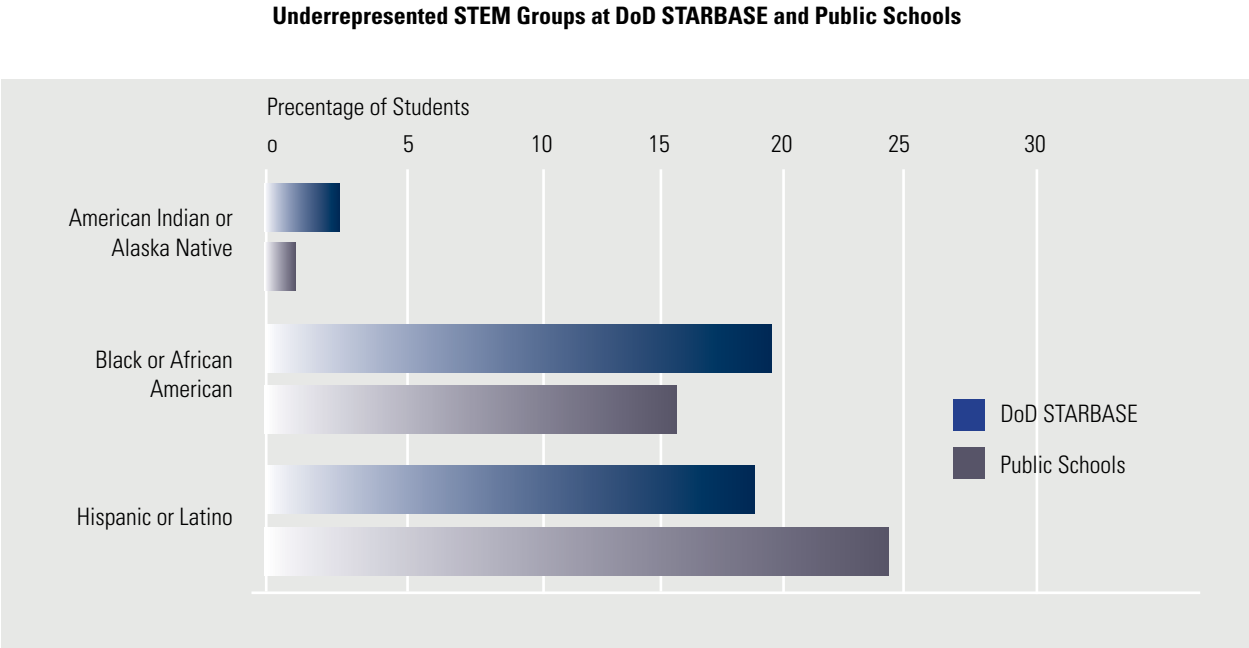



**Figure 1**. Public school statistics for the group Native Hawaiian or Other Pacific Islanders is not available.

GENDER COMPOSITION

While there are a few DoD STARBASE locations where the ratio between females and males is over-represented by one gender or the other, on the whole, the ratio is the same as in previous years with 49% female and 51% male.

## DoD STARBASE Staff

EMPLOYMENT AFFILIATION

The DoDI provides general guidelines on personnel models, salary parameters, and position descriptions. The primary employment affiliations are federal, state, and contractor agencies. Employment affiliation is an important consideration for each location. The employee's affiliation determines his/her salary administration, hiring requirements, benefits, personnel policy and practices, as well as reporting relationships. Federal and state affiliations often provide retirement and health benefits, which increases a location's personnel costs and uses a greater portion of the location's operating budget. Contractor affiliations make up 53% of the employment relationships followed by state and federal affiliations which are at 46% and 1%, respectively.

STAFFING MODEL

The DoDI outlines the prototypical staffing model for a DoD STARBASE location. It includes broad guidelines on pay scale for each staff position. This model is also the basis for an annual budget for each location. The staffing model includes four full-time paid staff positions: a director, a deputy director/instructor, an instructor, and an office manager/administrative assistant. Determination of starting salaries is the prerogative of each location. The suggested pay scale equivalencies of the above positions in the DoDI are GS 12-13, GS 11-12, GS 9-11, and GS 6-9, respectively.

Of the 59 DoD STARBASE locations, 10 operate with the four typical staff members of director, a deputy director/instructor, an instructor, and an office manager/administrative assistant. Many locations have made adjustments to the prototype staffing model. The most common changes in the staffing model are additions to instructional and classroom support staff in an effort to serve more students. Some locations restructure the administrative position to include instruction. Other DoD STARBASE locations have used the following adjustments: hire part-time instructors, establish job-sharing positions, consolidate job tasks, limit benefits, eliminate the deputy director position in favor of two instructors, eliminate the administrative position, and hire retirees who require fewer benefits. In FY 2015 "Other" DoD STARBASE positions included: DoD STARBASE 2.0 coordinators, teaching assistants, tech assistants, substitute instructors and modified deputy director/office manager. If a location does not meet the DoDI prescribed manning model, the director must submit a written request for a waiver to OASD/M&RA.

There was a 16% increase in the number of employees from FY 2014. Of the 59 DoD STARBASE locations in FY 2015, 30 operated with more than four staff members. Table 4 describes the FY 2014 and FY 2015 staffing profile for full- and part-time personnel. Full time is defined as an employee working more than 125 days per year.

**Table 4:**
**FY 2014 - FY15 Staffing Profile**

| Position | Number of Staff | | Full-Time | | Part-Time | |
|---|---|---|---|---|---|---|
| | FY 2014 | FY 2015 | FY 2014 | FY 2015 | FY 2014 | FY 2015 |
| Director | 44 | 46 | 44 | 46 | 0 | 0 |
| Deputy-Director/Instructor | 44 | 47 | 44 | 47 | 0 | 0 |
| Instructor | 91 | 128 | 68 | 105 | 23 | 23 |
| Office Manager | 34 | 41 | 23 | 38 | 11 | 3 |
| Other | 45 | 28 | 16 | 18 | 29 | 10 |
| **Total** | **258** | **290** | **195** | **254** | **63** | **36** |

Table 4 also shows there are fewer staff directors than DoD STARBASE locations. Some directors manage more than one location, some STARBASE locations are new and have not hired a director yet, and other STARBASE locations are in the process of replacing directors who have left the program.[8]

## STAFF DEVELOPMENT

DoD STARBASE instructors attend professional development to stay current in program content, methodologies, and curriculum. Eighty-nine percent of the DoD STARBASE locations offer staff development opportunities. Regional and national professional association programs, university courses, on-line training visits to other locations and in-service workshops are all used as professional development. Professional development keeps instructors up-to-date on emerging technology, curriculum, resources,

[8] Directors in Connecticut, North Carolina, Indiana, Oklahoma, Oregon, South Dakota, Montana, and Vermont operate multiple STARBASE locations.

and instructional modalities. Some instructors undergo additional requirements in their state to maintain a current teaching certificate (39%).

New staff members are typically trained on-the-job. Prior to teaching at DoD STARBASE, new instructors may observe experienced instructors, who often serve as their mentors. Instructors also attend regional workshops for delivery of computer aided design (CAD) software and updates to the DoD STARBASE curriculum.

STAFF CHANGES AND DEPARTURES

There were 55 staff departures in FY 2015. The majority (33 departures) were at the instructor level. Office Managers were the next highest with seven departures followed by teaching assistants at five departures. The overall turnover rate in FY 2015 was 21%, which is down from last fiscal year's turnover rate of 23%. Some (20%) of these staff were terminated while others elected to leave the STARBASE program. Directors reported that of those staff members who left the program, 17% indicated the reason for their decision to leave DoD STARBASE was because of a better opportunity at another academic institution. Others stated program funding uncertainty (15%), personal reasons (13%), and better financial opportunities (11%) for their decision to leave. A few of these positions (10 vacancies) remained unfilled at the end of FY 2015.

## VOLUNTEERS

Volunteers are an essential participant group in the DoD STARBASE program. They serve as presenters, board members, advisors, tour guides, and instructor aides and perform a wide variety of daily support services. Volunteers include military personnel, teachers, parents, and community leaders. All locations reported using volunteers.

The DoD STARBASE locations documented a total 8,051 volunteers who contributed a total of 188,846 hours to the program during FY 2015 (see Table 5). This is a 67% increase from FY 2014 which may be due to the stabilization of the program allowing locations to focus on the fundamentals of the DoD STARBASE program. As part of the objectives outlined under the Inspire goal of the DoD STEM Education and Outreach Strategic Plan, military personnel are encouraged to volunteer their time to the program as mentors, expert speakers, tour guides, and other support activities. After parents, military personnel account for the greatest amount of volunteers, followed by teachers.

**Table 5:**
**FY 2015 Volunteer Participation**

| | Volunteers | Hours |
|---|---|---|
| Military | 1,987 | 16,782 |
| Teachers | 1,795 | 132,546 |
| Parents | 3,834 | 35,389 |
| Other[9] | 435 | 4,129 |

[9] Other volunteers include STEM groups, firefighters, board members, etc.

**OUTREACH**

Many DoD STARBASE locations provide resources and training to local teachers. Of the 59 locations, 23 locations provided some kind of training to local teachers in FY 2015. Many DoD STARBASE locations (60%) reported they have relationships with nearby teacher colleges or training programs where student teachers may obtain practicum hours at DoD STARBASE. At the DoD STARBASE locations that offer teacher training, 70% of the teachers may use this training towards their certification requirements.

Students may attend DoD STARBASE at the fifth grade level, as well as participate in other outreach programs that are available in their area at other grade levels. OASD/M&RA encourages DoD STARBASE locations to connect with other local outreach programs to create a STEM pipeline for students. Directors from 41 of the 59 DoD STARBASE locations report that they have relationships with other outreach programs in their area to include: FIRST LEGO League, Civil Air Patrol, Girl Scouts and Boy Scouts. In addition, the DoD STARBASE location may coordinate a DoD STARBASE 2.0 program at the middle school level. DoD STARBASE 2.0 is a STEM-based afterschool mentoring program that is based at a collaborating school system[10].

Mentors provide a vital role in the success of the participants and the program, providing a role model of a successful STEM professional. Serial engagements with professionals in STEM careers allow students to network with someone successful in the field and envision pathways for themselves to pursue those careers. Additionally, mentoring can be a powerful experience for STEM professionals, building work skills and connecting them to their community.

## The DoD STARBASE Curriculum

Today's DoD STARBASE STEM curriculum is standardized, cutting-edge, research-based instruction that meets national educational standards and ensures a qualitative assessment of curriculum outcomes. Curriculum development is aligned with both the DoD STEM Education and Outreach Strategic goal to *Inspire* and two Priority Investment Areas within the Federal STEM Education 5-Year Strategic Plan: *Increase and Sustain Youth and Public Engagement and Better Serve Groups Historically Underrepresented in STEM Fields*. It also supports the Federal STEM Education goal to improve STEM instruction. As such, the DoD STARBASE curriculum is designed to increase the students' involvement and interest in STEM activities, enhance their understanding of the role that STEM literacy plays in their lives, strengthen potential for future careers, and make the pursuit of STEM activities more attractive and accessible. It also contains the presentation of accurate scientific information, which promotes the development of STEM skills, knowledge, and practices, thereby supporting the Federal goals of a learning investment.

The 36 learning objectives are clearly outlined for each of the curriculum's STEM categories, which are consistent with national education standards. The DoD STARBASE curriculum provides students the opportunity to engage in authentic scientific inquiries, which allow the participants to learn through experiential "hands on-minds on" based activities. For example, while studying the engineering design process, students design and create items with 3-D computer-assisted technology. The student summative assessment tool is applied pre- and post-program to determine if the learning objectives have been met.

[10] DoD STARBASE 2.0 programs are currently offered in California, Connecticut, Georgia, Indiana, Louisiana, Michigan, Minnesota, New Mexico, Ohio, Oklahoma, Oregon, South Dakota, Texas, Utah, West Virginia, and Wyoming. See the section on DoD STARBASE 2.0 in this report.

There are four basic types of lesson plans that are used to teach DoD STARBASE learning objectives:

1. Parent lesson plans provide the introductory background, instructional strategies and materials required to teach the overall concepts of the curriculum objective. These are shorter in length and are always used in conjunction with lesson plan appendices.

2. Appendix lesson plans offer a choice of activities that provide students "hands-on, minds-on" opportunities to understand the introductory material presented in the parent lesson plan. When instructors establish their teaching criteria, they will use the parent lesson plan and then choose one of the approved appendices to complete the lesson. This allows DoD STARBASE instructors to differentiate their approach to teaching the learning objective.

3. Activity Station lesson plans are intended to give students multiple activities to strengthen their understanding of the learning objective. These inquiry-based stations are generally short, and in most cases, a number of stations are taught in conjunction with a curriculum segment. For example, a number of activity station lesson plans are in the final stages of development to support teaching Bernoulli's Principles where one investigation of these principles might not be enough to ensure a higher level of understanding and application.

4. Stand-Alone lesson plans are complete, self-contained documents that fully address the stated components of the curriculum objective. They contain the necessary background information and instructional guidance and support criteria to meet the requirements for the objective.

This progressive curriculum is designed for DoD STARBASE students by a highly educated DoD STARBASE staff. Ideas for new lesson plans are solicited from the DoD STARBASE directors and are then vetted by a Curriculum Committee that is comprised of experienced DoD STARBASE staff members. Lesson plans are adopted using a peer-review process which utilizes the expertise of the DoD STARBASE staff who field-test the proposed activities to further improve the pedagogy and delivery methodology.

This rigorous process expands and enhances the DoD STARBASE curriculum offerings. DoD STARBASE directors and instructors may choose from multiple approved lesson plans to teach the required 36 objectives. Directors are asked to create a schedule outlining the lessons they have chosen to teach. Although the focus is on using the approved lessons to teach the required objectives, the schedule also includes any time spent on academy management, student breaks, lunch, and graduation to give an accurate portrayal of how students spend their days at each DoD STARBASE location. Curriculum schedules are submitted annually with the Directors' Questionnaire and are verified and validated during visitations by the evaluation team.

## The DoD STARBASE 2.0 Program Elements

DoD STARBASE 2.0 is a STEM-based afterschool mentoring program that is based at a collaborating school system. The objective is to serve students at other grade levels in the STEM areas beyond their initial DoD STARBASE experience. The program was introduced in 2010 and expanded to a dozen sites during the 2011-12 program year. After building to a high of 25 locations hosting 42 DoD STARBASE 2.0 programs in FY2013, the initiative dropped in FY 2014 to 15 locations and 25 2.0 programs due to the Government shutdown. The program rebounded in FY 2015 with 20 DoD STARBASE locations reporting coordinating a total of 41 DoD STARBASE 2.0 programs in 19 states (see Figure 2). Directors of the 20 FY 2015 locations were surveyed to obtain data on program requirements, participants, curriculum, staff, and funding for the DoD STARBASE 2.0 program.

**The DoD STARBASE 2.0 Program Locations**


**Figure 2.**

[11] A 2.0 program is defined by the location where 2.0 meetings take place. A 2.0 program location may operate a number of 2.0 clubs.

## PROGRAM REQUIREMENTS

DoD STARBASE 2.0 maintains a unique school-based afterschool program that targets at-risk sixth to eighth graders. The program takes place in partnering schools that have expressed the desire for additional DoD STARBASE program resources. As with other school-based afterschool mentoring programs, DoD STARBASE 2.0 is highly structured and intends to help support school goals, provide safe environments for students, and improve student-teacher relationships while empowering schools through student referrals. Basic program requirements are outlined in the DoD STARBASE 2.0 Program Guide. The guide lists expectations for program basics, the partnering school, participant eligibility, and the STEM Mentor Coordinator position. Compliance on several of the basic requirements is given below (see Table 6).

**Table 6:**
**Locations Meeting Basic Requirements**

| Basic Requirement | Percentage of Locations Meeting Requirement |
|---|---|
| DoD STARBASE 2.0 meetings are held at a school | 95 |
| There is ample space for meetings | 100 |
| Meetings are held after school hours | 98 |
| Parking is provided for mentors | 98 |
| A nutritional snack is provided for the students | 76 |
| The students are in 6th, 7th and/or 8th grades | 86 |

## PARTICIPANTS

In FY 2015, 31 school districts and 40 schools partnered with DoD STARBASE at 41 locations to operate 60 - 2.0 clubs. This large increase in the number of programs and clubs from FY 2014 (25 programs and 36 clubs) is largely due to the expansion of 2.0 programs by the DoD STARBASE locations that coordinated a 2.0 program in FY 2014. In addition, five DoD STARBASE locations coordinated new 2.0 programs in FY 2015[12].

DoD STARBASE 2.0 programs are sponsored by the Air Force, Air Force Reserve, Army and National Guard (see Table 7). The greatest numbers of programs (20 programs) are sponsored by the National Guard which also hosts the majority of the DoD STARBASE programs (44 DoD STARBASE locations).

[12] STARBASE Los Alamitos, STARBASE Savannah, STARBASE Indiana, Pelican State STARBASE, and Texas STARBASE Houston

**Table 7:**
**FY 2015 DoD STARBASE 2.0 Programs and Clubs by Military Affiliation**

| Service Arm | Number of 2.0 Programs | Number of 2.0 Clubs |
|---|---|---|
| Air Force | 8 | 9 |
| Air Force Reserve | 12 | 18 |
| Army | 1 | 1 |
| National Guard | 20 | 32 |
| Marine Corp | 0 | 0 |
| **Total** | **41** | **60** |

In FY 2015, the DoD STARBASE 2.0 program began with 1,072 student participants and finished with 848 students. The retention rate is 79%. Of the students who did not complete the program, 33% were females and 67% were males. Directors reported several reasons why students discontinued the program. Moving, time conflicts, and lack of interest in the chosen curriculum are the main reasons why students drop from the program.

Many of the FY 2015 DoD STARBASE 2.0 students were former DoD STARBASE students (60%) and most were males (67%). The average student attendance at club meetings was 14 students, with a 1:4 mentor-to-student ratio. The students are mostly 6th and 7th graders (40.1% and 27.1%, respectively) although some are from other grades (see Table 8).

**Table 8:**
**Grade Level of Participating Students**

| Grade Level | Percentage of Students |
|---|---|
| 4th Grade | 4.1 |
| 5th Grade | 6.8 |
| 6th Grade | 40.1 |
| 7th Grade | 27.1 |
| 8th Grade | 19.8 |
| 9th Grade | 0.1 |
| 10th Grade | 0.5 |
| 11th Grade | 1.0 |
| 12th Grade | 0.5 |

Figure 3 and Figure 4 show the ethnic and racial composition of the FY 2015 DoD STARBASE 2.0 students. Although this program is strictly a volunteer program, most groups of students historically underrepresented in STEM fields (Hispanics and Latinos, American Indian or Alaska Native, and Black or African American) are represented[13]. Higher participation of these groups in DoD STARBASE 2.0 may be due to the positive experience the students encountered at DoD STARBASE as indicated by attitudinal tests (see attitudinal test results).

**Ethnic Composition of DoD STARBASE 2.0 Student Population FY 2015**

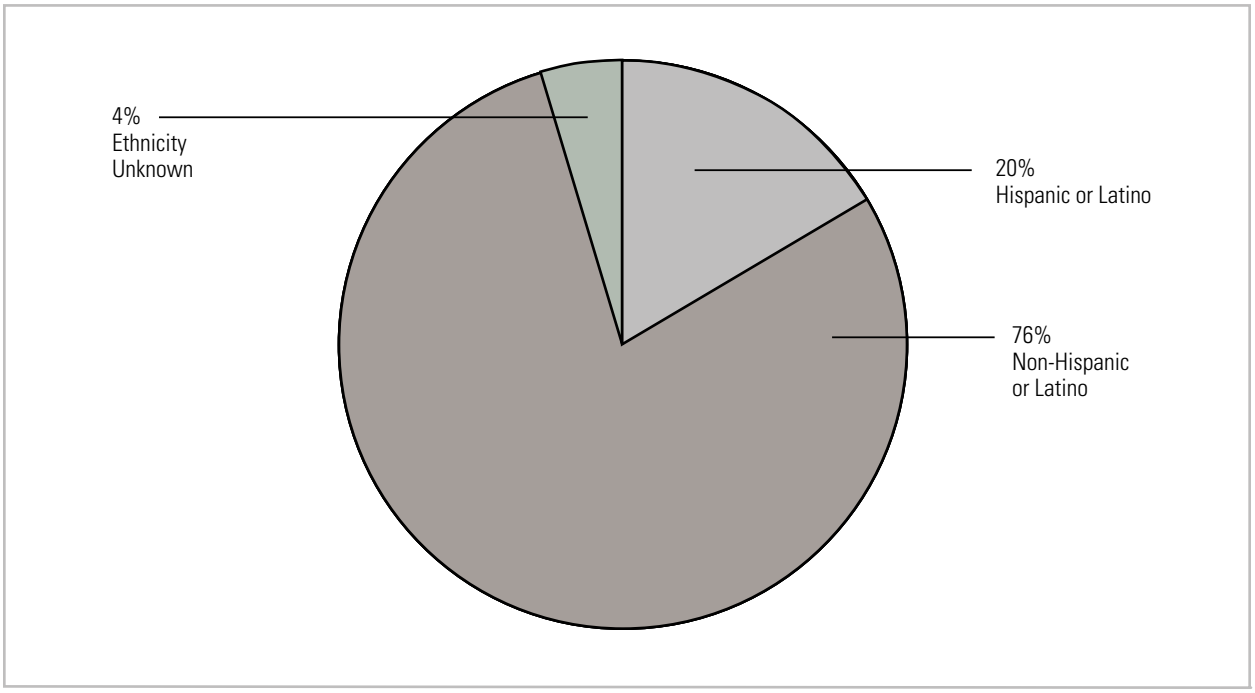



**Figure 3.** Ethnic groups historically underrepresented in STEM fields are: Hispanics and Latinos.

[13] Although the group "Native Hawaiian or Other Pacific Islander" is also historically underrepresented in STEM fields, STARBASE Hawaii does not coordinate a 2.0 program nor did this group attend another DoD STARBASE 2.0 program.

**Racial Composition of DoD STARBASE 2.0 Student Population FY 2015**

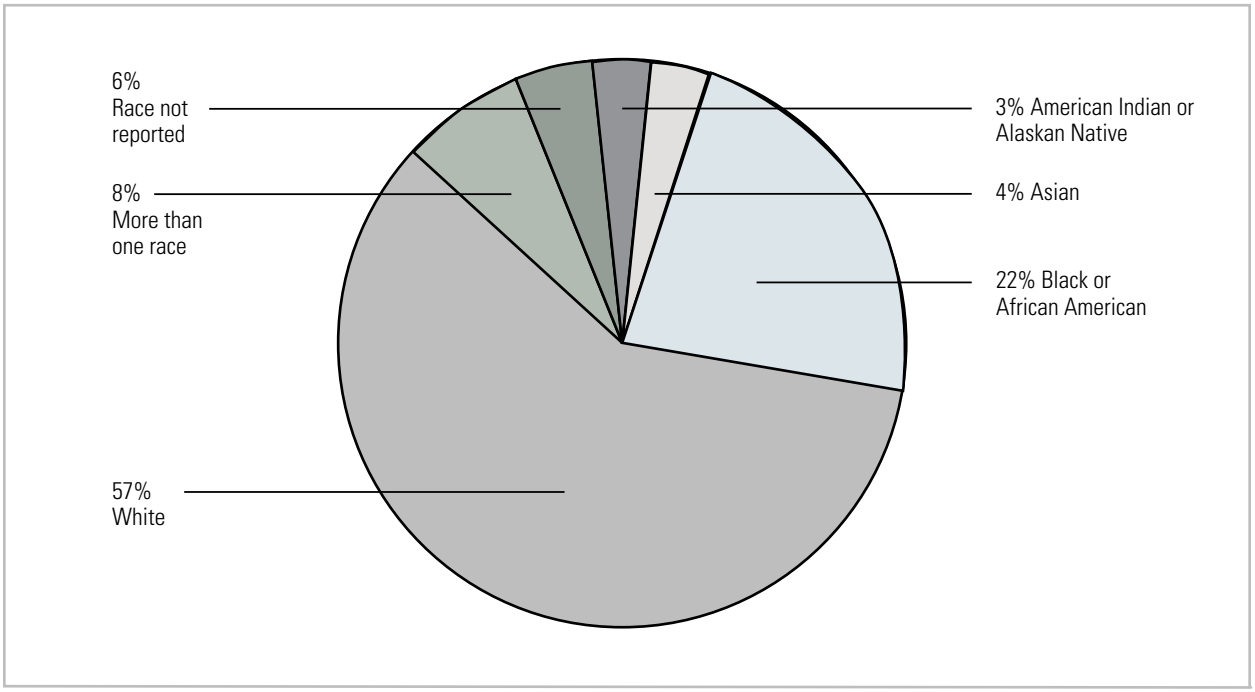



**Figure 4.** Racial groups historically underrepresented in STEM fields are: African Americans, American Indians, Alaska Natives, Native Hawaiians and Pacific Islanders.

## CURRICULUM

Over the course of three to five months, DoD STARBASE 2.0 students work on a team project at their school with a STEM mentor during club meetings. The outcomes for students participating in DoD STARBASE 2.0 are as follows:

- Increased STEM interest and knowledge
- Reduced high-risk behavior
- Increased engagement with school
- Increased career awareness

Program locations use a variety of different team projects to achieve these goals. STEM projects include: Scalextrics, robotics, rocketry, engineering, physics, FIRST LEGO League, solar cars, chemistry, technology, and aerospace. Some programs (46%) culminate the program with some sort of related competition. Of those programs, 32% participate in FIRST LEGO League competitions[14] and 16% participate in Team America Rocketry Challenge[15].

[14] FIRST LEGO League is a global competition where elementary and middle-school students build LEGO-based robots to complete tasks on a thematic playing surface.

[15] The Team America Rocketry Challenge (TARC) is an annual American model rocketry competition for students in grades 7 to 12 where students design, build and launch a rocket with specific characteristics.

STAFF

*STEM Mentor Coordinator*

DoD STARBASE 2.0 is primarily a volunteer program. The volunteer STEM mentors and volunteer classroom teacher are all coordinated by a designated DoD STARBASE STEM Mentor Coordinator. This is typically a part-time position and many programs choose to hire the STEM Mentor Coordinator in-house with their existing DoD STARBASE director, deputy director, program instructor, or office manager taking on the additional responsibilities. If hiring in-house is not possible, candidates are recruited from the partnering school or community. The responsibilities of the STEM Mentor Coordinator include:

- Program marketing
- Managing relationships with schools
- Recruiting and screening program volunteers
- Managing volunteer STEM mentors
- Coordinating and delivering volunteer training
- Tracking data
- Supporting and motivating program volunteers

These tasks play an invaluable role in the success of DoD STARBASE 2.0. Of the 20 DoD STARBASE locations that support a DoD STARBASE 2.0 program, 17 (85%) have a dedicated STEM Mentor Coordinator, which is up from 32% in FY 2014.

*STEM Mentor*

The ideal STEM mentor team consists of a lead STEM mentor, representatives from local STEM industries, college students, and members of the military. To serve as a DoD STARBASE 2.0 STEM mentor, volunteers must meet the following minimum requirements:

- Be at least 18 years of age
- Successfully pass mentor screening/background
- Volunteer approximately six hours per month through the school year

Of the mentors who participated in the In FY 2015 programs, 96% completed 2.0 training and all completed a background check. The mentors were male (57%) and female (43%). Mentors from a variety of STEM professions participated in the program including military, non-military, DoD professionals, industry professionals and college students (see Table 9). Working with a mentor, participating students are exposed to the lifelong benefits of higher education and a career in a STEM-related field. They may also receive guidance about educational and career options.

**Table 9:**
**Mentor Types**

| Type | Percentage of Mentors |
|---|---|
| Military | 36 |
| Non-Military, DoD, Professionals | 23 |
| Industry Professionals | 18 |
| College Students | 12 |
| Other[16] | 10 |

*Funding*

The DoD STARBASE 2.0 programs operate through a combination of federal and private funds. Of the 20 DoD STARBASE locations coordinating a 2.0 program, 50% receive funding from both sources[17] and 25% receive solely federal funds. Three programs reported that they do not receive any funds whatsoever to operate a 2.0 program[18].

## PROGRAM OVERSIGHT

### *Compliance*

The Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs (M&RA) has the overall responsibility for the management of the DoD STARBASE program. Department of Defense Instruction (DoDI) 1025.7 provides the policies and procedures that guide the current DoD STARBASE program locations. The DoDI directs the locations on operational requirements such as the number of classes, classroom hours, student numbers, target student population, participant eligibility, program site location for instruction, core curriculum, fiscal and property audits and frequency of them, and reporting requirements.

### *Compliance Procedures*

A compliance program was designed and developed to ensure that the DoD STARBASE locations adhere to the DoDI requirements as well as administrative directions and reporting requirements. The program is reviewed and adjusted each year based on OASD/M&RA guidelines. Over the past several years, DoD STARBASE locations have been evaluated using a performance assessment system that is composed of three progressive levels of program and organizational performance. Each level has a prescribed set of activities that range from obtaining adherence to the DoDI requirements that guide basic operating procedures and full installation of program delivery (Level I); to obtaining desirable operating applications, key planning strategies, and managerial efficiencies (Level II); and lastly, to exhibit advanced strategic program linkages and downstream relationships for promoting student skills and abilities in STEM-related activities (Level III). The sections below outline details and criteria of the performance assessment system.

[16] Other types of mentors include STARBASE employees, teachers, and parents.
[17] This is an increase of 24% from FY 2014.
[18] STARBASE Martinsburg, STARBASE Sioux Falls, and STARBASE Los Alamitos do not receive funding for a DoD STARBASE 2.0 program.

For each DoD STARBASE location, the assessment system not only requires the attainment of each of the objectives at each level but also their maintenance and sustainability over time to retain their status level. Performance level is determined through site visitations, academy reporting requirements, and periodic surveys. Shortfalls in required activities are usually handled through a corrective action schedule agreed upon by the participants and OASD/M&RA to successfully obtain the required performance level under review. In most cases, these corrective action plans are short-term and successfully obtained. The attainment of the performance level under review is held in abeyance until the corrective requirements are completed and verified.

The assessment system also requires that the academy can only advance to higher levels of performance after it successfully attains a positive assessment at the prior level (i.e., an academy must meet all required activities at Level I before it can claim any activities at Level II and so on). While an academy program could move towards and complete an activity at another level, the program would not be reviewed for acceptance until the prior level is successfully achieved.

The successful attainment of these levels of performance provides OASD/M&RA and the military service representatives a way to determine whether an academy may be selected and/or considered for special programs that will be made available to locations at the required level. The system also distinguishes and identifies those locations that operate at higher levels of performance to their sponsors and participant groups, the local community, the target group of students, the school systems, and military sponsors.

The assessment and validation of academy performance levels was placed on hold in FY 2014 in order to focus on documenting recovery efforts after the large staff turnover experienced in FY 2013. With 15 new directors joining the program, FY 2015 visitations included 11 new director orientations and 13 visits regarding compliance with and/or orientation to the DoD STARBASE curriculum. As programs in FY 2015 regained full operational status and Level I compliance, it was noted that outreach activities had declined. Confirmation of progress in outreach activities to include DoD STARBASE 2.0 participation will be the focus of the FY 2016 visitations.

### *Performance Level Descriptions*

#### *Level I: The Basic/Fully Operating Location*

Level I criteria includes all DoDI requirements and operating guidelines stipulated by OASD/M&RA. This incorporates required program activities such as student numbers, classroom hours, installation of core curriculum content, military-base program delivery, emphasis on target student population, required documentation (i.e., MOU's, student waivers, etc.), reporting requirements, and a number of administrative responsibilities such as written waivers, disability building accessibility, testing samples, teacher assessment, etc.

#### *Level II: The Advanced Performing Location*

The second level of performance requires attainment of Level I status and success with a set of defined operational, planning, and managerial upgrades, fiscal program operations, and the successful installation and maintenance of DoD STARBASE 2.0. These are organizational and administrative requirements set up by OASD/M&RA to obtain program delivery efficiencies and operational effectiveness.

These requirements include, but are not exclusive to, participant group involvement; program enhancements; STEM program inventories and an assessment of potential fit that enhances student participation in further skill development; budget management planning and review; public relation planning; personnel management plans; equipment status assessment; "children-at-risk" review; staff development/personnel plans; transfer of leadership plans (i.e., succession plans); management resource manuals; and several other considerations that upgrade program management and operating performance.

*Level III: A High Performing Location*

Academies must achieve Level I and II status levels before they can be assessed at Level III. Level III requires the development of an activity or set of activities that significantly advances the DoD STARBASE program vision and mission.

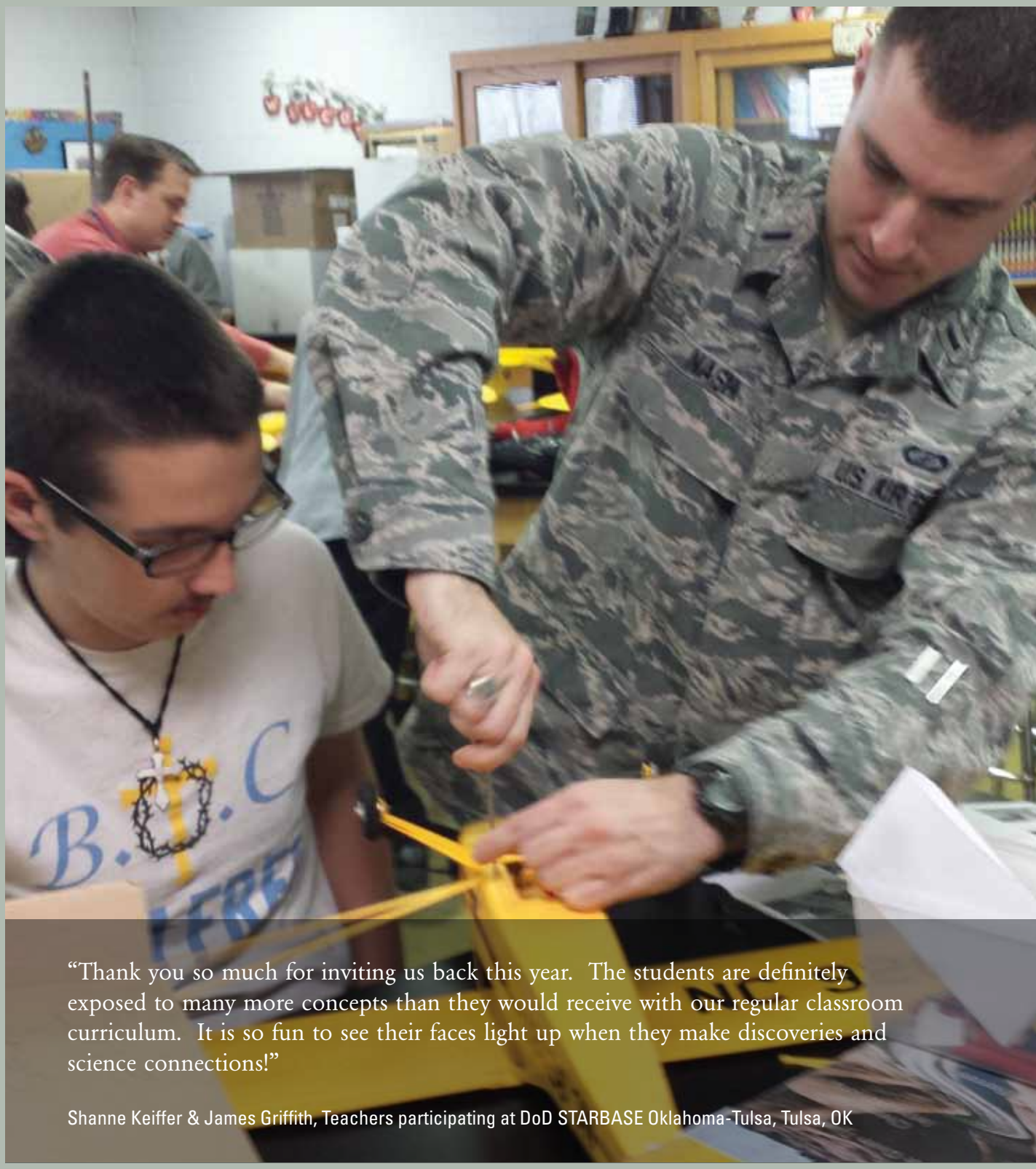
Operational and program enhancements, higher-level problem-solving techniques, time-sensitive improvements, and efficiencies in operations could be included in the assessment of Level III activities if they are of significant magnitude. High priority activities are those that promote the welfare and STEM skill/abilities of the student population, demonstrate program sustainability, provide transportability to other locations, and have the ability to be installed and operable within an 18-to-24 month period. The validation of the program's installation and sustainability, as well as the operational potential for transportability, would be reviewed by the evaluation team for approval by OASD/M&RA.

Each of the above level criteria are reviewed on an ongoing basis for location-wide application, appropriate-level designation, the typical period in which they can be successfully attained, and the ability for downstream sustainability. As collaborations and newly established operations are introduced, the academy performance level review process is expected to be refined and expanded.

## *Compliance Adherence*

Compliance visitations under DoDI 1025.7 are conducted at least once every three years for each DoD STARBASE location. The visitation involves a two to five-day review of documents, audits, fiscal reports, classroom observation, and structured interviews with staff, school administration, sponsor groups, not-for-profit board members (if appropriate), and members from other participant groups. At the conclusion of the visit, a meeting is conducted with the base commander and DoD STARBASE director to review the preliminary results of the compliance visit and to discuss if any corrective action is required. A plan-of-action is developed and a schedule for completion is mutually agreed upon. A written report is then sent to the OASD/M&RA program manager upon completion of the visitation. OASD/M&RA may share the key points of the report with the director and/or the base commander. A written summary of progress made by the DoD STARBASE director is sent to OASD/M&RA as corrective tasks are obtained, and copies may be forwarded to sponsors and military service representatives. Occasionally, a follow-up visitation is scheduled to document that corrective action has been taken.

Newly installed locations may receive an orientation visitation to outline DoDI requirements. The director and staff are briefed and provided information and materials on best practices, testing administration, reporting schedules, documentation, performance expectations, and protocols. This time is also used to answer any questions and concerns the staff and sponsors may have.



"Thank you so much for inviting us back this year. The students are definitely exposed to many more concepts than they would receive with our regular classroom curriculum. It is so fun to see their faces light up when they make discoveries and science connections!"

Shanne Keiffer & James Griffith, Teachers participating at DoD STARBASE Oklahoma-Tulsa, Tulsa, OK

The non-compliant activities most commonly noted are primarily technical in nature. They include lack of timely responses to periodic and required reporting schedules; lack of local financial and property audits within the required three year period and/or documented requests by the location to have them conducted by the appropriate local base agency; incomplete documentation and/or lack of a written request for modification to OASD/M&RA for exceptions or revisions on DoDI 1025.7 requirements; and incomplete implementation of the core curriculum. As previously indicated, given the number and scope of activities, the number of incidents is small, and involves only a few locations. Overall, most locations met compliance requirements. A small number of locations face challenges in obtaining student numbers, hours of instruction, audit schedules and completions, and meeting reporting requirements in a timely fashion.

## Fiscal Analysis

A congressional appropriation to the Department of Defense (DoD) funds the operation of DoD STARBASE. The Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs (M&RA) oversees the program and distributes funding. In FY 2015, the total program budget was $25,000,000. OASD/M&RA allocated $22,500,000 to program operations. The remainder of the appropriation was used for assessment activities, staff development and training programs, and overall program design and development activities.

In FY 2015, the average operating cost per location was $387,931 (see Table 10). This is a 5% decrease from FY 2014, due to an increase in student numbers and a 42% increase from the average cost per location in FY 2004.

**Table 10:**
**Average Cost Per Location 2004 - 2015**

| Fiscal Year | Average Cost Per Location |
|---|---|
| 2004 | $272,469 |
| 2005 | $273,040 |
| 2006 | $293,584 |
| 2007 | $301,773 |
| 2008 | $310,895 |
| 2009 | $317,638 |
| 2010 | $320,304 |
| 2011 | $331,482 |
| 2012 | $310,500 |
| 2013 | $319,408 |
| 2014[19] | $408,714 |
| 2015 | $387,931 |

[19] The 16-day Government shut down in October, 2013, severely impacted the overall DoD STARBASE program. Significant increases in staff turnover during FY 2013 and FY 2014 resulted in a reduction in the number of students, schools and districts served as well as the number of DoD STARBASE 2.0 programs.

Operational costs differ among DoD STARBASE locations. Overall expenditures of DoD STARBASE funds allocated to each program site are shown in Figure 5. Staff costs range from 30% to 97% of the location's budget which, on average, account for 74% of the site budget followed by equipment (9%), contract services (6%) and supplies (6%).

**FY 2015 Expenditures of DoD Funds**

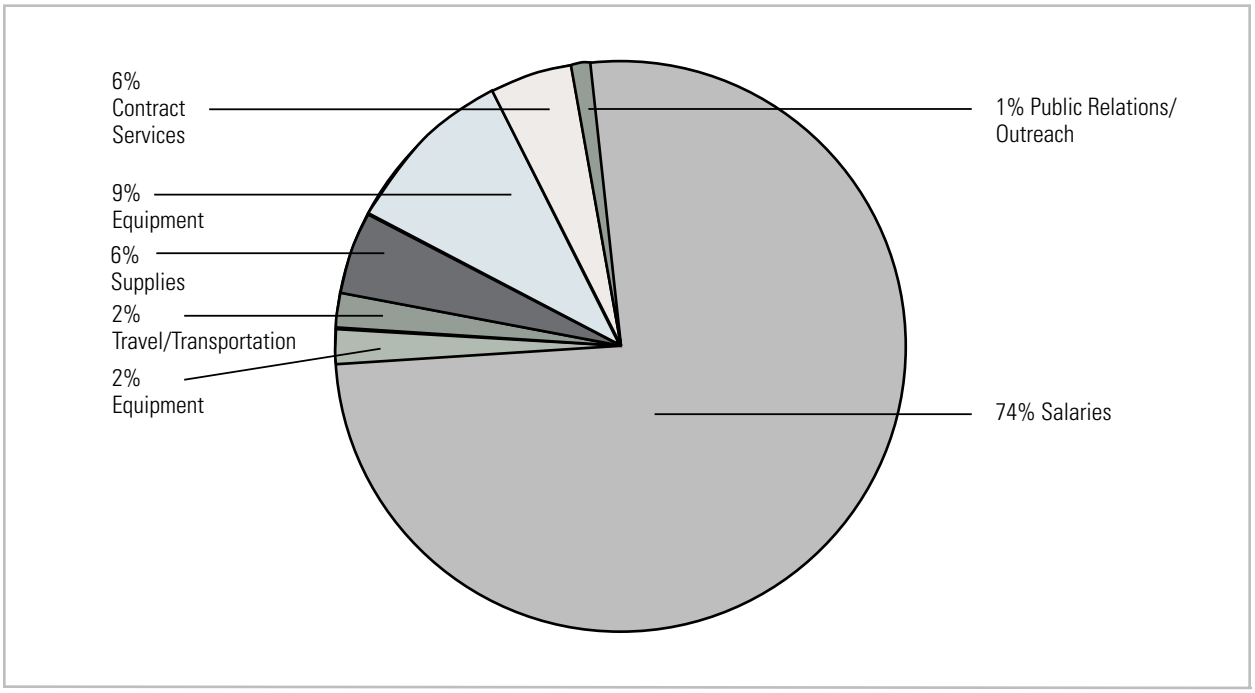



**Figure 5.**

Several factors contribute to the cost variances, including geographic location, outreach programs, and salary scales. OASD/M&RA annually reviews each location's budget to maintain an equitable distribution of funds. In addition, 25 of the 59 locations obtained supplemental funding from non-DoD sources. The total raised in supplemental funding for FY 2015 was $691,012. The average raised by locations that secured additional funding through state allocations, grants, and donations was $27,640. The total monies received from these sources were $61,381, $93,790, and $187,625, respectively. A total of $596,161 (86%) of supplemental funding was expended in FY 2015. Academies use supplemental funding for staff salaries (25%); program/curriculum development (5%); facilities/furnishings (8%); transportation/travel (5%); supplies (30%); equipment (8%); contract services (11%); public relations/outreach (3%); and other expenditures (5%).

# Assessment Results

## Student Assessment

### OVERVIEW

Annual program evaluation is accomplished in part by assessing student attitudes toward school, the military, and career opportunities as well as assessing knowledge gains in the core curriculum of science, technology, engineering, and math (STEM) concepts. Students complete the DoD STARBASE Student Questionnaire before the DoD STARBASE program and then again once the program is complete. The key pre- to post-assessment areas include:

Attitudes toward the military (e.g., military personnel, military locations)

Attitudes toward STEM topics

Attitudes toward STEM careers, both military and non-military

Knowledge items assessing the STEM curriculum

This year's DoD STARBASE Student Assessment uses a set of 18 knowledge items (14 retained from prior years) and 36 attitudinal items (15 from prior years). New knowledge items were piloted based on evolving curriculum materials and classroom activities. Pilot items and historical items are maintained in an item database for possible use in future administrations and to allow year-to-year comparisons.

#### *Instrument Design*

The core curriculum content underwent significant changes in 2010 and is updated regularly with new learning exercises and experiences for the students. In response, the DoD STARBASE Student Assessment is updated annually to:

- Continually align the assessment with the DoD STARBASE learning objectives and DoD sponsor objectives
- Gather data on pilot items that can be utilized in future assessments
- Minimize the risk of teaching to the assessment

As in previous years, the assessment for this year consisted of two separate instruments combined into one questionnaire. The first instrument was an 18 item multiple-response assessment of STEM knowledge that focused on the core DoD STARBASE curriculum. The second instrument was a 36-item survey measuring various aspects of students' attitudes and opinions about STEM and DoD STARBASE that impact areas such as academic success and future career goals.

- Knowledge Assessment – 17 multiple-choice items and one nomination item (select all responses that apply) were included in the knowledge assessment:
  - 14 items remained from previous versions with two of those items having historical reference benchmarks dating back to at least 2007.
  - Four new items were piloted this year.
  - The 17 multiple-choice items were used for most of the evaluations of knowledge gains, due to the different scoring pattern of the nomination item.

- Attitudinal Survey – 36 attitudinal items (31 administered both pre- and post-program; five administered post-program only) were included in the survey:
  - 15 items were retained from 2013 and 2014, with only slight wording changes.
  - Item order was modified in 2012 and 2015 to make it easier for students to follow the response option formatting.

The responses for the knowledge assessment and for the attitudinal survey are each then summarized based on item content areas to yield category scores as well as on overall score. The overall score for each instrument is presented as a mean score (i.e., group average score) and also as a percent score (i.e., percent correct for knowledge assessment; percent favorable for attitude survey) for groups of students in the following report.

### *Study Logistics*

The DoD STARBASE Student Assessment was administered between January and June of 2015. The Student Assessment was administered twice to the same participating class of students (pre- and post-program) at each participating academy to gauge program impact. The assessments were shipped directly to the DoD STARBASE academies and included the following instruction sets:

Directors' Instructions – Overview of the DoD STARBASE evaluation components including details such as administration methodology, selection of participating classes, and an answer key for the knowledge assessment.

Administrator Instructions – Detailed instructions to the assessment coordinators including the materials needed for administration, filling out the assigned student numbers, and instructions to be read during the administration of the questionnaire.

Completed questionnaires were returned to General Dynamics Information Technology (General Dynamics IT) for processing using scan form technology.

### *Student Demographic Information*

The Student Assessment was administered during the first half of 2015, with a total of 2,667 (1,346 pre-program and 1,321 post-program) surveys returned to General Dynamics IT for processing. Responses were received from 55 of the 59 DoD STARBASE academies (96% academy response rate) compared to 49 in 2014 (86%), and 74 academies in 2013 (99%).

Surveys were matched pre- and post-program based on unique student ID. Those with matching data for both the pre- and post-program were retained for analysis resulting in a total of 2,508 surveys (1,254 matching cases for pre- and post-program assessments). All of the 1,254 matching cases had no more than three missing items for the pre-questionnaire and no more than three missing items for the post-questionnaire. These 1,254 cases are referenced throughout this report.

The frequency and percent of DoD STARBASE students that reported belonging to the various demographic categories are presented in Table 11 and Table 12. As in previous years, the DoD STARBASE student population is evenly split between boys and girls (49.9% and 49.8% respectively). Most of the students were in the fifth grade (93.8%) and between 10 – 11 years old (92.7%).

**Table 11:**
**Demographic Profile of Student Sample**

| Item | Response | Frequency | Percent |
|---|---|---|---|
| Age | 9 | 30 | 2.4 |
| | 10 | 494 | 39.4 |
| | 11 | 669 | 53.3 |
| | 12 | 57 | 4.5 |
| | 13 | 3 | 0.2 |
| | Unknown/No answer | 1 | 0.1 |
| Grade | 4 | 50 | 4.0 |
| | 5 | 1176 | 93.8 |
| | 6 | 27 | 2.2 |
| | Unknown/No answer | 1 | 0.1 |
| Gender | Boy | 626 | 49.9 |
| | Girl | 625 | 49.8 |
| | Unknown/No answer | 3 | 0.2 |

*Note: Percentages may not total to 100% within categories due to rounding.*

DoD STARBASE locations throughout the United States were represented, with nearly 45% of student assessments coming from the South (24.5%) or Southeast (20.4%) combined. Another 47% came from the Midwest (32.4%) and the West (14.2%). A smaller number of students were served in the East (8.5%).

Fifty-two percent of DoD STARBASE programs (653 students) brought students in one day per week versus the students coming to the program every day within a one week time span (41% of academies including 517 students). Seven of the DoD STARBASE academies reported being aware of testing accommodations, indicating that the program is accessible to students that may need special accommodations during the program sessions.

**Table 12:**
**Demographic Profile of Academy Sample**

| Item | Response | Academy Frequency | Student Frequency | Percent |
|---|---|---|---|---|
| Region | East | 5 | 107 | 8.5 |
| | Midwest | 16 | 406 | 32.4 |
| | South | 14 | 307 | 24.5 |
| | Southeast | 12 | 256 | 20.4 |
| | West | 8 | 178 | 14.2 |
| Class Schedule | Consecutive | 23 | 517 | 41.2 |
| | One per week | 28 | 653 | 52.1 |
| | Other schedule | 3 | 63 | 5.0 |
| | Unknown/No answer | 1 | 21 | 1.7 |
| Accommodations | Not aware of testing accommodation | 48 | 1,099 | 87.6 |
| | Aware of testing accommodation | 7 | 155 | 12.4 |

Students' previous exposure to the military and the DoD STARBASE program is presented in Table 13. Familiarity with the military and with DoD STARBASE was reviewed to gauge experience with the military in general and with DoD STARBASE in particular. Most of the students knew someone who went through DoD STARBASE (64.3%), had heard about DoD STARBASE (59.8%), or had met military people before coming to the DoD STARBASE program (61.2%).

**Table 13:**
**Students' Prior Experience with Military and DoD STARBASE**

| Item | Response | Frequency | Percent |
|---|---|---|---|
| I have met military people before coming to DoD STARBASE | No | 485 | 38.7 |
| | Yes | 767 | 61.2 |
| | Unknown/No answer | 2 | 0.2 |
| I heard about DoD STARBASE before I knew I was coming here | No | 501 | 40.0 |
| | Yes | 750 | 59.8 |
| | Unknown/No answer | 3 | 0.2 |
| I know someone that went through DoD STARBASE before me | No | 446 | 35.8 |
| | Yes | 806 | 64.3 |
| | Unknown/No answer | 2 | 0.2 |

## STUDENTS' ATTITUDINAL RESPONSES

The following analysis provides a summary of the Attitudinal Survey results for both the pre-program survey and the post-program survey. The analysis includes those surveys with no more than three missing items for either survey. The attitudinal items were rated using a 7-point Likert scale with a range of responses from one (Strongly Disagree) through seven (Strongly Agree).

For the students responding to both the pre- and post-program attitude questionnaire, many of their pre-program responses started out positive and increased in favorability post-program. This suggests that these students entered the program with generally positive attitudes that were reinforced throughout the program.

### *Pre/Post Attitudinal Survey Means*

Pre- and post-program Attitudinal Survey total mean scores are shown in Table 14. Total mean scores are a composite averaged score of all the items on the survey with a possible range from one (least favorable) to seven (most favorable). The pre-program means include the 31 core survey items. The post-program means include the 31 core survey items as well as the five post-program items. As in the previous years, there was a significant increase in post-program mean scores as compared to pre-program mean scores, indicating that immediately following the program, students responded more favorably.

**Table 14:**
**Pre/Post Attitudinal Survey Means and Standard Deviations (2008-2015)**

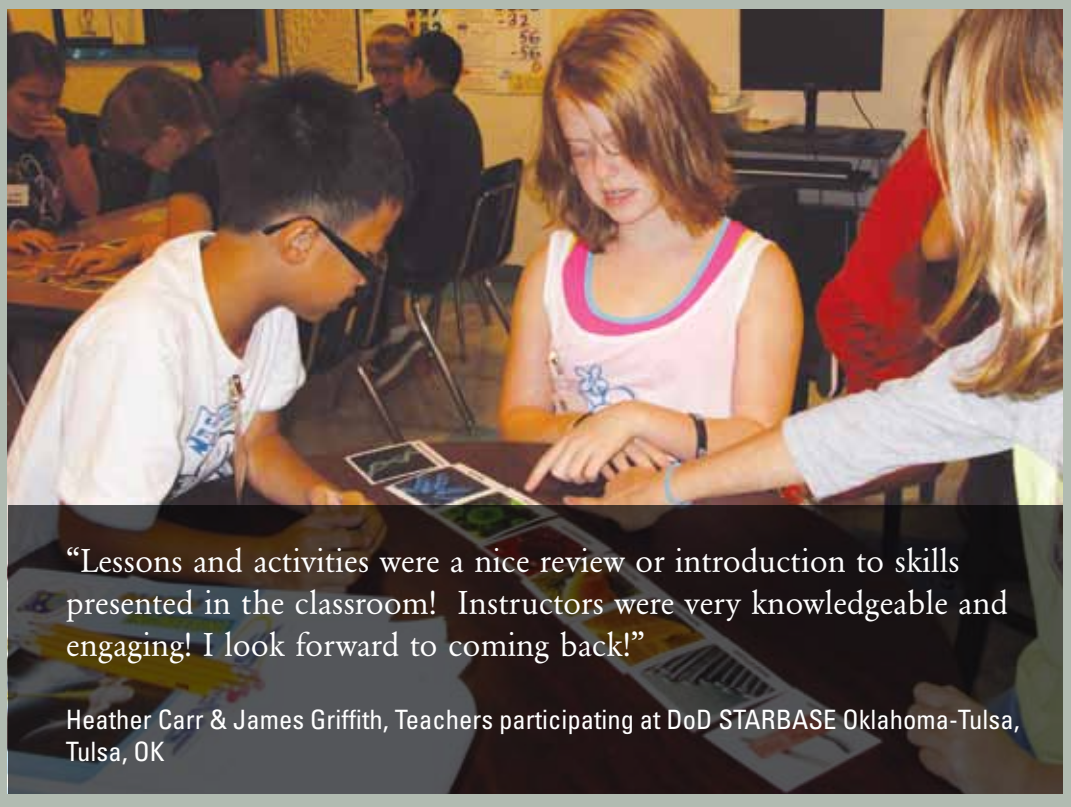
| Survey | 2015 Mean* | 2008-2015 Average* |
|---|---|---|
| Pre-Program | 5.18 | 5.70 |
| Post-Program | 5.59 | 5.91 |
| Survey | Std. Dev. | Std. Dev. |
| Pre-Program | .86 | 0.69 |
| Post-Program | .86 | 0.70 |

** Pre- and post-program means are significantly different.*

Table 15 rank-orders the items based on post-program means from most favorable to least favorable. Most of the items show an increase in favorability from pre- to post-program means. The 26 bolded items (84% of the items) show a significant increase in favorability from pre-program to post-program attitudes. Three additional items show trends that fell just short of statistical significance [I like figuring out how to use technology gear (tablets, smart phones, etc.); I need to do well in math to get the kind of job I want; I am good at math]. Dramatic improvements in attitudes toward STEM fields include the following, many of which are new attitude items for this year:

- I am aware of some STEM careers.* (increase of .76)
- Most people use STEM skills every day.* (increase of .58)
- I like engineering.* (increase of .57)
- I am interested in being a scientist or engineer. (increase of .52)
- STEM jobs are exciting.* (increase of .51)
- I would like a job in a science-related area.* (increase of .49)
- Engineers help solve challenging problems.* (increase of .46)
- I enjoy learning about STEM topics.* (increase of .43)

**New item in 2015*



"Lessons and activities were a nice review or introduction to skills presented in the classroom! Instructors were very knowledgeable and engaging! I look forward to coming back!"

Heather Carr & James Griffith, Teachers participating at DoD STARBASE Oklahoma-Tulsa, Tulsa, OK

**Table 15:**
**Pre/Post Rankings and Mean Scores of Student Attitudinal Responses**

| Pre-Program N=1,254 | | Attitudinal Item | Post-Program N=1,254 | |
|---|---|---|---|---|
| Mean | Rank | | Mean | Rank |
| Post Only | | DoD STARBASE is boring. (Reversed scored) | 6.52 | 1 |
| Post Only | | I have enjoyed coming to a military base. | 6.49 | 2 |
| Post Only | | At DoD STARBASE, I learned a lot of things that I can use. | 6.43 | 3 |
| **6.29** | **1** | **I do not think DoD STARBASE will help me do better in school. (Reversed scored)** | **6.42** | **4** |
| Post Only | | DoD STARBASE Instructors made learning about STEM topics fun. ** | 6.37 | 5 |
| 6.15 | 2 | I like figuring out how to use technology gear (tablets, smart phones, etc.).** | 6.23 | 6 |
| Post Only | | I would tell my friends to come to DoD STARBASE. | 6.22 | 7 |
| **6.13** | **3** | **People who work on a military base do lots of different things.** | **6.21** | **8** |
| **5.85** | **6** | **People who work for the military use technology in their jobs.**** | **6.14** | **9** |
| **5.91** | **5** | **Scientists work on things that will make life better.**** | **6.08** | **10** |
| **5.92** | **4** | **I like technology.**** | **6.04** | **11** |
| **5.80** | **7** | **Military bases are exciting.** | **5.98** | **12** |
| **5.36** | **13/14** | **Most people use STEM skills every day.**** | **5.94** | **13** |
| **5.43** | **10/11** | **I think learning about STEM topics will help me in my daily life.**** | **5.82** | **14/15** |
| **5.36** | **13/14** | **Engineers help solve challenging problems.**** | **5.82** | **14/15** |
| **5.71** | **8** | **I want to learn more about technology.** | **5.81** | **16** |
| 5.60 | 9 | I need to do well in math to get the kind of job I want.** | 5.68 | 17 |
| **4.82** | **24** | **I am aware of some STEM careers.**** | **5.58** | **18** |
| **5.43** | **10/11** | **I like science.** | **5.57** | **19** |
| 5.41 | 12 | I am good at math. | 5.48 | 20 |
| **5.02** | **19** | **I enjoy learning about STEM topics.**** | **5.45** | **21** |
| **5.17** | **15** | **I am good at science.** | **5.44** | **22** |
| **5.07** | **18** | **A military base is a good place to work.** | **5.42** | **23** |
| **4.90** | **22** | **STEM jobs are exciting.**** | **5.41** | **24** |
| **4.81** | **25** | **I like engineering.**** | **5.38** | **25** |
| **5.11** | **16** | **I would take classes on technology if available.**** | **5.31** | **26** |
| **4.91** | **20/21** | **I want to learn more about engineering.**** | **5.27** | **27** |
| **4.78** | **26** | **When I finish school, I would like to get a job where I could use STEM.**** | **5.17** | **28** |
| 5.09 | 17 | I like math. | 5.16 | 29 |
| **4.85** | **23** | **Learning about science is easy for me.** | **5.15** | **30** |
| **4.55** | **27/28** | **I would take engineering classes if offered.**** | **4.95** | **31** |
| 4.91 | 20/21 | I would like to take more science classes.** | 4.92 | 32 |
| **4.55** | **27/28** | **I would like to take more math classes.**** | **4.65** | **33** |
| **4.03** | **29** | **I would like a job in a science-related area.**** | **4.52** | **34** |
| **3.97** | **30** | **I am interested in being a scientist or engineer.** | **4.49** | **35** |
| **3.92** | **31** | **I would like to join a science club at my school.**** | **4.05** | **36** |

** Item reverse-scored (a higher score is associated with a more positive attitude).*

*** New item in 2015.*

*Bold items show statistically significant changes.*

### *Shifts in Students' Attitudes*

Table 16 provides the top ten significant pre- to post-program attitudinal shifts for the 2015 program. As expected, the attitudinal items resulted in a positive shift from pre-program mean responses to post-program mean responses. In particular, there was a .77 increase from pre- to post–program mean response in awareness of STEM careers. There also were impressive changes, averaging +.18, on three items reflecting positive attitudes towards military bases (+.34), the use of technology by the military (+.29) and the diversity of activity on military bases (+.08). These significant changes pre- to post-program, plus the students' greater positivity toward learning science, math and computers after attending DoD STARBASE, indicate that the DoD STARBASE program is achieving many of its primary goals.

**Table 16:**
**The Top 10 Ranking of Attitudinal Item Shifts from Pre- to Post-Program in 2015**

| Attitudinal Item | Mean Positive Shift Pre- to Post-program |
|---|---|
| I am aware of some STEM careers.* | 0.77 |
| Most people use STEM skills every day. * | 0.58 |
| I like engineering.* | 0.56 |
| I am interested in being a scientist or engineer. | 0.52 |
| STEM jobs are exciting.* | 0.51 |
| I would like a job in a science-related area.* | 0.48 |
| Engineers help solve challenging problems.* | 0.46 |
| I enjoy learning about STEM topics.* | 0.44 |
| I would take engineering classes if offered.* | 0.40 |
| When I finish school, I would like to get a job where I could use STEM.* | 0.40 |

** New item in 2015*

### *Math and Science Attitudinal Ratings*

Similar to previous years, students' mean attitudes in Table 17 on science and math are more positive post- as compared to pre-program. In addition, students have larger shifts in being good at math and science post-program, suggesting that the exposure to STEM concepts taught within the program curriculum is giving the students more confidence in their abilities pertaining to math and science.

**Table 17:**
**Math and Science Attitudinal Item Mean Scores (2015)**

| Math and Science Attitudinal Items | Pre-Program Mean | Post-Program Mean | Gap Score• |
|---|---|---|---|
| I like science. | 5.45 | 5.57 | +0.12 |
| I am good at science. | 5.17 | 5.45 | +0.28 |
| I am good at math. | 5.41 | 5.48 | +0.07 |
| I like math. | 5.09 | 5.16 | +0.07 |

## *Military-Related Attitudes*

### *Shifts in Military-Related Attitudes*

Table 18 shows the four items in the Attitudinal Survey related to perceptions surrounding the military. The item, "I have enjoyed coming to a military base," was administered post-program only and received a mean of 5.98 out of a possible 7.00, indicating a very positive rating. Positive ratings also were observed for the items "People who work on a military base do lots of different things" (mean = 6.21) and "People who work for the military use technology in their jobs" (mean = 6.14). Although the item "A military base is a good place to work" (mean = 5.42) was ranked lower than other items, it was still substantially above the 3.5 midpoint of the scale, and increased significantly as a function of participation in the DoD STARBASE program (change = +.34, $t(1219) = 7.36$, $p < .0001$). In general, it appears that students' attitudes about the military are positively influenced by their DoD STARBASE experiences. The Appendix provides explanations of the statistical techniques used to analyze group differences and relationships throughout this report.

**Table 18:**
**Attitudinal Shifts on Military-Related Items (2015)**

| Military Attitudinal Items | 2015 |
|---|---|
| | Shift |
| I am enjoying coming to a military base. | Post Only |
| Military people do lots of different things. | +.08 |
| Military bases are exciting. | +.18 |
| The military is a good place to work. | +.34 |

*Comparison of High vs. Low Military Attitude*

Overall military attitudes were calculated based on a composite of those items administered both pre- and post-program. Student responses to the following items were summed for the post-program assessment only: "People who work on a military base do lots of different things," "A military base is a good place to work," and "Military bases are exciting." Students with a sum total of 20 or 21 on those three items in the post-program assessment were categorized as having high military attitudes (n=445). Students with a sum total of 13 or less on those three items were categorized as having low military attitudes (n=145). "I have enjoyed coming to a military base" was administered post-program only and was not included within the military attitude scale. Table 19 provides the responses for all the attitudinal items rank-ordered from largest to smallest gap score between the high and low military attitude groups. As expected, the first several items are those that make up the composite scale. Other large differences between high and low military attitudes reflect:

- More interest in STEM careers, broadly described (e.g., "When I finish school, I would like to get a job where I could use STEM", "STEM jobs are exciting")
- More interest in science ("I would like to take more science classes", "Scientists work on things that will make life better", "I would like to join a science club at my school")
- More interest in technology ("I want to learn more about technology", "I like figuring out how to use technology gear [tablets, smart phones, etc.]")
- More interest in engineering ("I want to learn more about engineering", "Engineers help solve challenging problems")
- More interest in mathematics ("I need to do well in math to get the kind of job I want", "I would like to take more math classes")
- Greater appreciation for the DoD STARBASE program ("At DoD STARBASE, I learned a lot of things that I can use", "DoD STARBASE Instructors made learning about STEM topics fun")

In short, students with more receptive attitudes toward the military appear to also be more highly motivated in regard to STEM learning and applications. All of the gap differences between students with high or low military attitude scores are statistically significant.

"I had pretty high expectations for the program, and my son was very excited in the months and weeks beforehand, but I could not have anticipated the high quality of our experience."

Teacher participating at DoD STARBASE Minnesota, Minneapolis, MN

**Table 19:**
**Statistically Significant Post-Program Gap Scores Based on Low and High Military Attitudes**

| Attitude Item | Low Military Attitude (n = 145) | High Military Attitude (n = 445) | +/- Gap |
|---|---|---|---|
| **Post-program Attitudes (mean total) Composite Score** | **4.67** | **6.07** | **1.4** |
| A military base is a good place to work. | 3.15 | 6.73 | 3.58 |
| People who work on a military base do lots of different things. | 4.16 | 6.95 | 2.79 |
| People who work for the military use technology in their jobs.* | 4.31 | 6.93 | 2.61 |
| Military bases are exciting. | 4.65 | 6.63 | 1.98 |
| When I finish school, I would like to get a job where I could use STEM.* | 4.10 | 5.86 | 1.77 |
| I think learning about STEM topics will help me in my daily life.* | 4.60 | 6.36 | 1.75 |
| I want to learn more about engineering.* | 4.16 | 5.85 | 1.69 |
| Engineers help solve challenging problems.* | 4.70 | 6.34 | 1.64 |
| I would like a job in a science-related area.* | 3.51 | 5.13 | 1.61 |
| I enjoy learning about STEM topics.* | 4.44 | 6.01 | 1.57 |
| I would take engineering classes if offered.* | 4.10 | 5.62 | 1.52 |
| I would take classes on technology if available.* | 4.40 | 5.90 | 1.50 |
| STEM jobs are exciting.* | 4.45 | 5.95 | 1.50 |
| Most people use STEM skills every day.* | 4.99 | 6.44 | 1.46 |
| I am aware of some STEM careers.* | 4.63 | 6.01 | 1.38 |
| I like engineering.* | 4.56 | 5.91 | 1.35 |
| I am interested in being a scientist or engineer. | 3.71 | 5.05 | 1.34 |
| I would like to take more science classes.* | 4.22 | 5.47 | 1.25 |
| I have enjoyed coming to a military base. | 5.56 | 6.77 | 1.22 |
| I need to do well in math to get the kind of job I want.* | 4.94 | 6.11 | 1.17 |
| I would like to take more math classes.* | 3.88 | 5.05 | 1.17 |
| Scientists work on things that will make life better.* | 5.25 | 6.41 | 1.16 |
| I would like to join a science club at my school.* | 3.35 | 4.51 | 1.15 |
| Learning about science is easy for me. | 4.37 | 5.50 | 1.14 |
| I want to learn more about technology. | 5.09 | 6.23 | 1.14 |
| I would tell my friends to come to DoD STARBASE. | 5.44 | 6.56 | 1.12 |
| I like math. | 4.34 | 5.44 | 1.10 |
| I like science. | 4.90 | 5.97 | 1.07 |
| I like technology.* | 5.43 | 6.41 | 0.99 |
| At DoD STARBASE, I learned a lot of things that I can use. | 5.72 | 6.71 | 0.98 |
| I like figuring out how to use technology gear (tablets, smart phones, etc.).* | 5.62 | 6.56 | 0.94 |
| DoD STARBASE Instructors made learning about STEM topics fun.* | 5.66 | 6.57 | 0.91 |
| I am good at math. | 4.77 | 5.67 | 0.90 |
| I am good at science. | 4.94 | 5.75 | 0.81 |
| DoD STARBASE is boring. (Reversed Scored) | 6.17 | 6.50 | 0.53 |
| I do not think DoD STARBASE will help me do better in school. (Reversed Scored) | 6.12 | 6.51 | 0.39 |

*(Reversed scored) This item was reverse-scored; therefore a higher mean average value reflects a more positive attitude.*

** New item in 2015*

Knowledge total scores were also compared against military attitudes. Table 20 shows that those with high military attitude and those with low military attitude scores did not significantly differ in their pre-program mean knowledge ($F(1,589) = 1.26$, $p = .26$). In the post-program assessment, by contrast, those with high military attitudes displayed a stronger performance than those with low military attitudes ($F(1,589) = 11.26$, $p = .001$). Both groups (high and low military attitude scores) had significant gains in knowledge scores pre- to post- program ($F(1,588) = 894.28$, $p < .0001$), but the high military attitude score group showed significantly greater improvement (+4.69 vs. +3.94, $F(1,588) = 6.76$, $p = .01$).

**Table 20:**
**Pre/Post Knowledge Assessment Mean Scores for High and Low Military Attitude Students**

| Military Attitudes | Sample Size | Pre-Program Mean | Std. Deviation | Post-Program Mean | Std. Deviation |
|---|---|---|---|---|---|
| High Military Attitude | 445 | 7.58 | 2.79 | 12.27* | 3.21 |
| Low Military Attitude | 145 | 7.28 | 2.84 | 11.22* | 3.48 |

**Significant increase in post-program means.*

### *Gender Comparisons and Attitudinal Differences*

The following two tables provide the Attitudinal Survey mean total scores, as well as the item-level detail comparing the responses for both boys and girls. Table 21 shows the overall differences in responses based on gender for both the pre- and post-program responses. Although boy's attitude scores were significantly more positive than girls at the pre-program assessment (5.28 vs. 5.08, $F(1, 1250) = 17.60$, $p < .0001$), the gap had been cut by 20% by the post-program assessment (5.67 vs. 5.51; $F(1, 1250) = 10.68$, $p < .001$).

Boys and girls did not significantly differ on 22 of the post-program items measuring favorable attitudes to STEM and the DoD STARBASE program. Boys displayed more positive attitudes toward DoD STARBASE and STEM than girls on 14 items as shown by Table 22. These include five items related to engineering (e.g. "I would take engineering classes if offered"), five items related to technology (e.g. "I want to learn more about technology"), and one item each focused on math and STEM ("I am good at math" and "When I finish school, I would like to get a job where I could use STEM"). The Appendix contains a complete listing of the attitude items comparing girls and boys on pre-program and post-program means. The Appendix also provides a comparison of the gap scores from pre- to post-program for girls and boys separately.

**Table 21:**
**Gender Differences on Pre/Post Attitude Survey Mean Total Scores**

| | Sample Size | Pre-Program Mean | Post-Program Mean | Performance Gap Score |
|---|---|---|---|---|
| Boys | 626 | 5.28 | 5.67 | +.39 |
| Girls | 625 | 5.08 | 5.51 | +.43 |

**Table 22:**
**Gender Gap Score Differences in Post-Program Attitude Survey Mean Item Scores**

| Attitude Item | Girls' Mean | Boys' Mean | B-G Difference |
|---|---|---|---|
| Boys More Favorable than Girls | | | |
| I would take engineering classes if offered.* | 4.60 | 5.30 | 0.70 |
| I am interested in being a scientist or engineer. | 4.16 | 4.82 | 0.66 |
| I like engineering.* | 5.10 | 5.66 | 0.56 |
| I want to learn more about engineering.* | 5.01 | 5.53 | 0.52 |
| I would take classes on technology if available.* | 5.07 | 5.56 | 0.49 |
| I want to learn more about technology. | 5.61 | 6.00 | 0.39 |
| People who work for the military use technology in their jobs.* | 5.97 | 6.30 | 0.33 |
| Military bases are exciting. | 5.82 | 6.14 | 0.32 |
| I like technology.* | 5.90 | 6.17 | 0.27 |
| I am good at math. | 5.35 | 5.60 | 0.25 |
| I like figuring out how to use technology gear (tablets, smart phones, etc.).* | 6.11 | 6.36 | 0.25 |
| When I finish school, I would like to get a job where I could use STEM.* | 5.06 | 5.28 | 0.22 |
| Engineers help solve challenging problems.* | 5.71 | 5.91 | 0.20 |
| A military base is a good place to work. | 5.33 | 5.51 | 0.18 |

**New item in 2015*

## *Prior Experience with the Military*

### *Comparisons Based on Prior Experience with Military Personnel*

Prior experience with military locations and/or personnel was related to the pre- and post-program attitudinal patterns of the students. Prior experience was determined by affirmative responses to the demographic item "I have met military people before coming to DoD STARBASE." As expected, those with prior military exposure had more positive attitudes before and after the program, which is shown on 13 items, and more favorable post-program attitudes on 4 items compared to those with no prior military exposure (Table 23). There was one item on which participants with prior exposure to the military had more favorable attitudes only on the pre-program assessment ("I like technology") and one item on which participants without prior exposure to the military had more favorable attitudes only on the pre-program assessment ("I would like to take more math classes"). Because those differences were no longer evident at the end of the program, they are not included in Table 23.

**Table 23:**
**Significant Differences in Attitudinal Items Based on Prior Military Contact**

| More Positive with Prior Military Contact |
|---|
| I am good at science. (Pre & Post) |
| Learning about science is easy for me. (Pre & Post) |
| I am interested in being a scientist or engineer. (Pre & Post) |
| Military bases are exciting. (Pre & Post) |
| Engineers help solve challenging problems.* (Pre & Post) |
| A military base is a good place to work. (Pre & Post) |
| I would take engineering classes if offered.* (Pre & Post) |
| I would take classes on technology if available.* (Pre & Post) |
| I am aware of some STEM careers.* (Pre & Post) |
| I like engineering.* (Pre & Post) |
| Most people use STEM skills every day.* (Pre & Post) |
| People who work on a military base do lots of different things. (Pre & Post) |
| People who work for the military use technology in their jobs.* (Pre & Post) |
| I would like a job in a science-related area.* (Post only) |
| I want to learn more about engineering.* (Post only) |
| When I finish school, I would like to get a job where I could use STEM.* (Post only) |
| I think learning about STEM topics will help me in my daily life.* (Post only) |

*Note: Mean values of item responses by prior military contact group are omitted for simplicity. They are available upon request.*
**New item in 2015*

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### *Gender Differences Based on Prior Experience with Military Personnel*

Experience with military personnel was also reviewed based on gender differences for both attitudinal (Table 24) and knowledge-based pre- and post-program responses (Table 25). The positive impact of prior exposure to the military did not interact with gender on pre-program attitudes ($F(1, 1248) = .10$, $p = .75$), but there was an interaction of prior exposure with gender on post-program attitudes ($F(1, 1248) = 4.42$, $p = .04$). That is, boys' post-program attitudes were highly favorable regardless of whether or not they had prior exposure to the military, but girls who had prior exposure to the military had post-program attitudes that were significantly more favorable than girls who had not had prior exposure.

There was a significant direct effect of prior exposure to the military on pre-program knowledge scores ($F(1, 1248) = 34.25$, $p < .0001$), but there was no effect of gender ($F(1, 1248) = 1.95$, $p < .16$) nor any interaction between gender and exposure ($F(1, 1248) = 2.51$, $p < .11$) on pre-program knowledge scores. Similarly, there was a significant direct effect of prior exposure to the military

on post-program knowledge scores (F (1, 1248) = 27.22, p <.0001). However, there was no effect of gender on post-program knowledge scores (F (1, 1248) = 0.06, p<.81), nor any interaction between gender and prior exposure (F (1, 1248) = 0.15, p =.70). Thus, these patterns of results suggest that individual differences in mean knowledge scores are more likely derived from prior military experience rather than being related to gender, whether assessed pre- or post-DoD STARBASE program.

**Table 24:**
**Prior Experience with the Military Attitudinal Differences by Gender**

| | No Prior Experience with Military | | Prior Experience with Military | | Difference Between Post-Program Means |
|---|---|---|---|---|---|
| | Pre-Program Mean | Post-Program Mean | Pre-Program Mean | Post-Program Mean | |
| Boys | 5.18 | 5.64 | 5.34 | 5.69 | +.05 |
| Girls | 5.04 | 5.37 | 5.14 | 5.63 | +.26 |

**Table 25:**
**Prior Experience with the Military Knowledge Differences by Gender**

| | No Prior Experience with Military | | Prior Experience with Military | | Difference Between Post-Program Means |
|---|---|---|---|---|---|
| | Pre-Program Mean | Post-Program Mean | Pre-Program Mean | Post-Program Mean | |
| Boys | 7.02 | 11.51 | 8.22 | 12.42 | +0.91 |
| Girls | 7.05 | 11.48 | 7.77 | 12.54 | +1.06 |

### *Comparisons Based on Prior Knowledge of DoD STARBASE*

Knowledge of the program was measured by responses to, "I heard about DoD STARBASE before I knew I was coming here." Those familiar with DoD STARBASE responded significantly more favorably to 16 of the Attitudinal Survey items both pre- and post-program (Table 26), indicating that they started and finished the program with more positive attitudes. Further, students who had heard of DoD STARBASE responded significantly more favorably to two additional items post-program. In addition to producing generally more favorable attitudes, the DoD STARBASE program eliminated the differences between those with prior knowledge of DoD STARBASE and those lacking such knowledge on the following items:

- STEM jobs are exciting.
- I would take classes on technology if available.
- People who work for the military use technology in their jobs.

**Table 26:**
**Significant Differences on Attitudinal Survey Items Based on Knowledge of DoD STARBASE Ranked High to Low**

| Pre- and Post-Program | Pre-Program Only |
|---|---|
| I am good at science. | I have enjoyed coming to a military base. |
| Learning about science is easy for me. | I would tell my friends to come to DoD STARBASE. |
| Military bases are exciting. | |
| I am good at math. | |
| I would like a job in a science-related area.* | |
| Engineers help solve challenging problems.* | |
| A military base is a good place to work. | |
| I like science. | |
| I would take engineering classes if offered.* | |
| I am aware of some STEM careers.* | |
| I like engineering.* | |
| Most people use STEM skills every day.* | |
| I want to learn more about engineering.* | |
| People who work on a military base do lots of different things. | |
| I like figuring out how to use technology gear (tablets, smart phones, etc.).* | |
| Scientists work on things that will make life better.* | |

*Note: All attitudes were more positive among students with prior knowledge. Mean values of item responses by DoD STARBASE knowledge group are omitted for simplicity. They are available upon request.*
** New item in 2015*

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### *Impact of Student Age and Grade on Reported Attitudes*

Table 27 presents statistically significant correlations between a student's age and grade in school with Attitudinal Survey items. Although the age and grade reports are correlated ($r = .379$, $p < .0001$), grade seems to be a more reliable and consistent predictor of student attitudes. Grade correlated with 12 attitudes, compared to only three for age. This is reasonable, because students participate with their classmates by grade level, and not by age. Though the magnitudes of the relationships are all fairly small, the positive relationships suggest that students in higher grades may serve as role models to students in lower grades for a positive engagement in the DoD STARBASE program, including an appreciation for STEM, specifically engineering and science. This year, students in higher grades were less likely to like math or find military bases exciting, suggesting that might be a focus for future years for that group. The complete Pearson Correlation matrix for the Attitudinal Survey items and selected student characteristics is presented in the Appendix.

**Table 27:**
**Relationships of Student Age and Grade With Post-Program Attitudinal Responses**

| | Correlation | |
|---|---|---|
| | Grade | Age |
| Learning about science is easy for me. | .058* | .081** |
| STEM jobs are exciting. | .007 | . 089** |
| Engineers help solve challenging problems.^ | .038 | .086** |
| I would take engineering classes if offered.^ | .029 | .056* |
| I am aware of some STEM careers.^ | .069* | .161** |
| I like engineering.^ | .047 | .095** |
| Most people use STEM skills every day.^ | .063* | .113** |
| I want to learn more about engineering.^ | .034 | .056* |
| I enjoy learning about STEM topics.^ | .020 | .058* |
| When I finish school, I would like to get a job where I could use STEM.^ | .017 | . 068* |
| Military bases are exciting. | .020 | -.057* |
| I like math. | -.047 | -.091** |

**Correlation is significant at the 0.05 level (2-tailed).*
*** Correlation is significant at the 0.01 level (2-tailed).*
*^ New item in 2015*

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## *Comparisons Based on Class Schedule*

Academies were compared based on class schedule (Table 18). Class schedule was categorized as meeting:

- On consecutive days (23 academies and 517 students)
- Once per week (28 academies and 658 students)
- Some other schedule (3 academies and 63 students)

Students attending on consecutive days demonstrated the highest pre-program and post-program knowledge scores, but students who attended once per week showed comparable knowledge gains (improvement of 4.47 once per week vs. 4.58 for consecutive day students). Students attending on consecutive days also demonstrated the highest gains in attitudinal scores (improvement of .46 consecutive day students vs. .35 for once per week students).

**Table 28:**
**Class Schedule Pre-program and Post-program Knowledge and Attitudinal Scores**

| | Knowledge Scores• | | | Attitudinal Scores | | |
|---|---|---|---|---|---|---|
| | Pre-Program | Post-Program | Gap | Pre-Program | Post-Program | Gap |
| Consecutive | 8.19 | 12.77 | 4.58 | 5.20 | 5.66 | 0.46 |
| Once per week | 7.32 | 11.79 | 4.47 | 5.17 | 5.52 | 0.35 |

** Means are significantly different across class schedule.*

### *Attitude Dimensions*

To help simplify and gain greater insight into the impact of the DoD STARBASE program on student attitudes, the attitude items were grouped into seven dimensions. Initial groupings into six categories were made on the basis of a priori rational conceptualizations during the design phase of the assessment. These were later empirically refined by follow-up statistical confirmation using principal components analysis (PCA), a standard data reduction method, with actual student response data. The definitions are provided below. The specific items and the results of the PCA analysis are presented in the Appendix. Each of the seven dimensions is highly reliable, based on Cronbach's, a statistical index of measurement consistency and coherence:

- STEM Concept Awareness –Recognition of the value of technology in everyday life (4 items, = .816)
- Future Planning –Expression of interest in future careers and taking relevant classes, especially in STEM (8 items, = .905)
- Science Confidence –Appreciation for science and a positive view of one's capacity for learning science (5 items, = .895)
- Math Confidence –Enjoyment of math and belief in personal ability to do well in mathematics (4 items, = .760)
- STEM Behavior & Motivation Identification with the importance of STEM and the roles of engineers and scientists in solving problems and improving life (5 items, = .829)
- Military Setting Endorsement –Positive impressions about enjoying military facilities and the diversity of work activities done by people on military bases (5 items, = .759)
- DoD STARBASE Program Evaluation Positive rating of the impact of the DoD STARBASE program on learning and enthusiasm to convey that to others (5 items, = .848)

Pearson correlations among the seven attitude dimensions, student demographic characteristics and post-DoD STARBASE Total Knowledge (discussed in the following section) were calculated and are presented in the Appendix. The dimensions are moderately correlated with each other, as would be expected, yet are distinct enough to reflect clear aspects of student attitudes toward STEM, careers, the military and DoD STARBASE. STEM Behavior & Motivation ($r = .294$, $p < .0001$) and Future Planning ($r = .210$, $p < .0001$) are the strongest predictors of post-program Total Knowledge scores.

Contrast analyses were performed between pre-program and post-program scores on the first six dimensions (Table 29). As with the individual item trends, there were increases in favorable attitudes on the dimension scores from pre-program to post-program. All differences were statistically significant.

**Table 29:**
**Pre-Program and Post-Program Attitudinal Dimension Scores**

| Attitude Dimension | Pre-Program | Post-program | Gap |
|---|---|---|---|
| STEM Concept Awareness | 22.60 | 23.10 | +0.50 |
| Future Planning | 36.45 | 40.16 | +3.70 |
| Science Confidence | 24.04 | 24.92 | +0.88 |
| Math Confidence | 20.44 | 20.75 | +0.31 |
| STEM Behavior & Motivation | 26.61 | 28.94 | +2.33 |
| Military Setting Endorsement | 22.96 | 30.05 | +7.09 |
| DoD STARBASE Program Evaluation | | 31.33 | |

Contrasts were also conducted between the girls' and boys' post-program scores (Table 30). At the end of the DoD STARBASE program, boys' attitude scores exceeded girls' scores on STEM Awareness, Future Planning and Military Setting Endorsement. Perhaps even more noteworthy is the finding that girls were not significantly different from boys on Science Confidence, Math Confidence, STEM Behavior and Motivation or DoD STARBASE Program Evaluation.

**Table 30:**
**Gender Gap Score Differences in Post-Program Attitude Dimension Scores**

| Attitude Dimension | Girls' Mean | Boys' Mean | B-G Difference |
|---|---|---|---|
| STEM Concept Awareness | 22.45 | 23.74 | 1.29** |
| Future Planning | 38.72 | 41.59 | 2.87** |
| Science Confidence | 24.99 | 24.85 | -0.14 |
| Math Confidence | 20.57 | 20.91 | 0.34 |
| STEM Behavior & Motivation | 28.93 | 28.92 | -0.01 |
| Military Setting Endorsement | 29.56 | 30.53 | 0.97** |
| DoD STARBASE Program Evaluation | 31.21 | 31.43 | 0.22 |

### *Drivers of Student Attitude*

The subsections of Table 31 provide a list of non-overlapping statistical predictors for specific target student attitudes. The predictors, or drivers, are rank-ordered by relative impact of the driver attitude on the target attitude. This indicates that if the conditions in each list are present (that is, more favorable attitude is expressed), it is very likely the target attitude also will be present.

The Adjusted R Square values indicate the cumulative amount of the variance, or variability, across students in their attitudes about DoD STARBASE and STEM-related topics that the drivers explain. That is, these attitude items predict student feelings about particular aspects of the DoD STARBASE program with an increasing degree of efficiency. Thus, they provide a condensed model from which to tell what makes students more enthusiastic about the program and about STEM. Many consider these lists to be prioritized action items for improving the target attitude.

### *Considerations Based on Drivers*

There are repeating drivers that appear to have a broad impact on the target attitudes. One main driver affected five of the target attitudes:

- Scientists work on things that will make life better.

Three other drivers each impacted three target attitudes:

- DoD STARBASE Instructors made learning about STEM topics fun.
- A military base is a good place to work.
- People who work on a military base do lots of different things.

Eight additional drivers affected two target attitudes:

- DoD STARBASE is boring. (Reversed scored)
- Engineers help solve challenging problems.
- I have enjoyed coming to a military base.
- I like science.
- I think learning about STEM topics will help me in my daily life.
- I want to learn more about engineering.
- I want to learn more about technology.
- People who work for the military use technology in their jobs.

These outcomes suggest that DoD STARBASE instructors should continue to stress the value of science, continue to make learning fun, and continue to emphasize the positive qualities of military bases. Other drivers of student attitudes, such as liking science, and wanting to learn more about engineering and technology, are important predictors, but may follow from the more potent predictors. To the extent that academies are able to create a stimulating, rewarding and supportive learning environment, positive student attitudes can be enhanced and reinforced, which may pay continuing dividends over the longer term after DoD STARBASE attendance. These desirable outcomes include word of mouth endorsement, further pursuit of learning about technology, STEM career motivation, and support for the military.

**Table 31:**
**Drivers of Key Target Attitudes (Post-Program Responses)**

| Target Attitude | Drivers of Target Attitude | Adjusted R Square |
|---|---|---|
| At DoD STARBASE, I learned a lot of things that I can use. | I would tell my friends to come to DoD STARBASE. | 0.287 |
| | DoD STARBASE Instructors made learning about STEM topics fun.* | 0.363 |
| | Engineers help solve challenging problems.* | 0.402 |
| | I like science. | 0.415 |
| | People who work on a military base do lots of different things. | 0.423 |
| | I need to do well in math to get the kind of job I want.* | 0.428 |
| | I want to learn more about technology. | 0.432 |
| | Scientists work on things that will make life better.* | 0.436 |
| | I do not think DoD STARBASE will help me do better in school. (Reversed scored) | 0.438 |
| I would tell my friends to come to DoD STARBASE. | DoD STARBASE Instructors made learning about STEM topics fun.* | 0.288 |
| | At DoD STARBASE, I learned a lot of things that I can use. | 0.378 |
| | DoD STARBASE is boring. (Reversed scored). | 0.430 |
| | Military bases are exciting. | 0.441 |
| | I like math. | 0.447 |
| | I want to learn more about engineering.* | 0.451 |
| | I think learning about STEM topics will help me in my daily life.* | 0.458 |
| | Scientists work on things that will make life better.* | 0.461 |
| I want to learn more about technology. | DoD STARBASE Instructors made learning about STEM topics fun.* | 0.442 |
| | At DoD STARBASE, I learned a lot of things that I can use. | 0.528 |
| | DoD STARBASE is boring. (Reversed scored). | 0.546 |
| | Military bases are exciting. | 0.555 |
| | I like math. | 0.563 |
| | I want to learn more about engineering.* | 0.569 |
| | I think learning about STEM topics will help me in my daily life.* | 0.573 |
| | Scientists work on things that will make life better.* | 0.576 |
| I am interested in becoming a scientist or engineer. | I would like a job in a science-related area.* | 0.409 |
| | I would take engineering classes if offered.* | 0.544 |
| | I like engineering.* | 0.566 |
| | When I finish school, I would like to get a job where I could use STEM.* | 0.573 |
| | People who work on a military base do lots of different things. | 0.578 |
| | I want to learn more about technology. | 0.581 |
| | Scientists work on things that will make life better.* | 0.583 |
| | I would like to take more math classes.* | 0.584 |
| | I would like to take more science classes.* | 0.587 |
| | I like science. | 0.590 |

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**Table 31: (Continued)**
**Drivers of Key Target Attitudes (Post-Program Responses)**

| Target Attitude | Drivers of Target Attitude | Adjusted R Square |
|---|---|---|
| Military bases are exciting. | A military base is a good place to work. | 0.304 |
| | I have enjoyed coming to a military base. | 0.432 |
| | People who work for the military use technology in their jobs.* | 0.443 |
| | I am good at math. | 0.448 |
| | People who work on a military base do lots of different things. | 0.452 |
| Military people do lots of different things. | People who work for the military use technology in their jobs.* | 0.256 |
| | A military base is a good place to work. | 0.321 |
| | Scientists work on things that will make life better.* | 0.347 |
| | I have enjoyed coming to a military base. | 0.356 |
| | Engineers help solve challenging problems.* | 0.364 |
| | I am interested in being a scientist or engineer. | 0.370 |
| | I am aware of some STEM careers.* | 0.374 |
| | Military bases are exciting. | 0.377 |

** New item in 2015*

### *Student Knowledge and Skills*

The 18 items of the Knowledge Assessment were categorized according to the DoD STARBASE curriculum area that they most closely measure in order to calculate scale scores. The following table (Table 32) breaks down the Knowledge Assessment items into the specific curriculum areas measured. Only the item stems are presented here.

"Thank you for putting on such a great program and the fact that it was free is completely incredible. I am a firm believer that if you get kids interested and excited in math, science, etc. at an early age, you have them hooked for the tough years coming ahead."

Teacher participating at DoD STARBASE One, Selfridge, MI

**Table 32:**
**Scored and Pilot Knowledge Items by Curriculum Area**

| Chemistry Science (E3.1.1.2) | |
|---|---|
| Item # | |
| 1 | Sodium and chloride bond to form salt (NaCl). What does this bonded substance represent? |
| 5 | Which pie chart represents the correct composition of air? |
| 10 | Which of the following is an example of physical change? |
| 14 | Which of the following states of matter have the least amount of kinetic energy? |
| **Engineering (E3.1.1.4)** | |
| Item # | |
| 2 | By constructing a 3D scale model of a car, a person can learn all of the following EXCEPT: |
| 3 | Why are prototypes a key part of the engineering design process? |
| 11 | When using computer design software to build a model, the first step is to… |
| **Mathematics Operations & Applications (E3.1.1.5)** | |
| Item # | |
| 4 | Which of the following is typically measured in nanometers? |
| 9 | In the graph above, find the letter that is at the coordinates (3,-2). Is it A, B, C, or D? |
| 12 | Of the following, which tool would be appropriate to measure the volume of a glass of milk? |
| 15 | An engineer is testing how well three different towels absorb liquids over three trials. The data for the experiment is in the table below. Select the graph that correctly represents the data of the experiment. |
| Physics (E3.1.1.1) | |
| Item # | |
| 6 | Two boats are floating by each other and passing cargo from one boat to the other. Based on Bernoulli's Principle, what happens if water is forced between the two boats? |
| 13 | What scientific law makes it important to wear a seat belt? |
| Technology (E3.1.1.3). | |
| Item # | |
| 7 | You are working on a new product to melt snow and ice on walkways. You test the product by measuring the time it takes for the area to become safe for walking. What conclusion would you make based on the following results? |
| 17 | You start out at the star (coordinates -1, 3) and walk two kilometers North, then 1 Kilometer West and stop for lunch. After lunch, you head to your friend's house which is five kilometers to the East. Where does your friend live? |
| 8 | Which of the following would be a good reason to use latitude and longitude coordinates? |
| STEM Awareness | |
| Item # | |
| 16 | STEM (Science, Technology, Engineering, and Math) jobs can involve which of the following? |
| 18 | Who uses STEM concepts in their job? (Select all that apply) |

*Pre/Post Knowledge Items by Curriculum Area*

Table 33 shows the pre- and post-program assessment mean score by curriculum area. All item categories (e.g., Chemistry, Physics) show significant improvement post-program as compared to responses prior to participation in DoD STARBASE. The largest improvement was seen in Physics (+46.25). Similar to 2014, the smallest post-program increases were in the Engineering (+13.08) and Technology (+17.15) areas.

**Table 33:**
**Pre/Post Knowledge Scores by Curriculum Area**

| Curriculum Area | # of Items | Pre-Program Percentage Score | Post-Program Percentage Score* | Gap |
|---|---|---|---|---|
| **Knowledge Item Total** | **17** | **44.80** | **71.11** | **26.31** |
| Chemistry | 4 | 34.05 | 72.03 | 38.68 |
| Engineering | 1 | 66.75 | 79.82 | 13.08 |
| Engineering Pilot | 2 | 48.19 | 65.34 | 17.15 |
| Math | 4 | 48.64 | 71.17 | 22.53 |
| Physics | 2 | 22.89 | 69.14 | 46.25 |
| Technology | 3 | 55.74 | 73.14 | 17.40 |
| STEM Awareness Pilot | 1 | 73.29 | 79.67 | 6.38 |
| STEM Job Awareness Pilot | 25 | 10.73 | 14.55 | 3.82 |

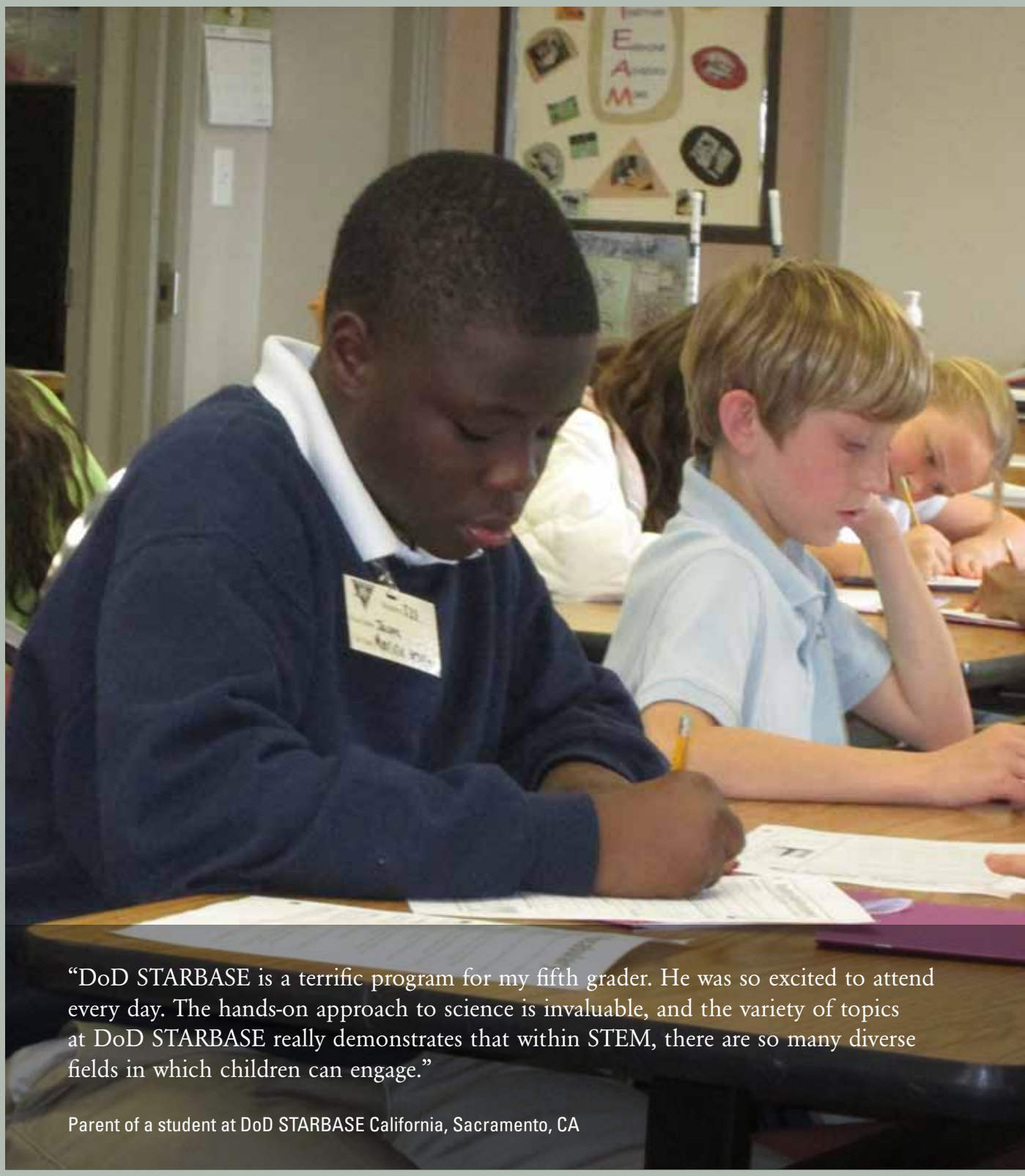
** All subtotal means are statistically significantly higher than pre-program means*

*Pre/Post Knowledge Scores*

Table 34 compares the pre- and post-program mean scores, percent correct, and gap differences for the Knowledge Assessment. The difference between pre-and post-assessment scores is statistically significant.

**Table 34:**
**Pre/Post Knowledge Assessment Mean Total Scores and Percent Correct (2015)**

| Year | 2015 |
|---|---|
| # of Items | 17 |
| Pre-Program Score | 7.62 (44.8%) |
| Post-Program Score | 12.09 (71.1%) |
| Gap | +4.47 (26.3%) |



"DoD STARBASE is a terrific program for my fifth grader. He was so excited to attend every day. The hands-on approach to science is invaluable, and the variety of topics at DoD STARBASE really demonstrates that within STEM, there are so many diverse fields in which children can engage."

Parent of a student at DoD STARBASE California, Sacramento, CA

*Pre/Post Knowledge Items by Curriculum Area*

Table 35 presents the gap difference for each item based on pre- to post-program percentage correct. The percentage of students answering an item correctly significantly increased for all items from pre- to post-program. Students who participate in DoD STARBASE come with a basic understanding of the concepts taught in the program, as evidenced by the percentage of students who answer certain items correctly pre-program. For example, two-thirds (67%) of the incoming students responded correctly to a question about the elements of the design process. The DoD STARBASE curriculum helped to boost that to four-fifths (80%), an increase of 13%. Knowledge of concepts that were unknown pre-program typically had much larger increases after the program. For example, correct answers to the item asking about Bernoulli's Principle increased from 8% to 68%, resulting in a 60% increase in those responding correctly pre- to post-program. Across all items, the average increase in correct responding from pre- to post-program in 2015 was 26% compared to 19% in 2014 and 21% in 2013.

**Table 35:**
**Pre/Post Knowledge Item Mean Percentage Correct**

| | 2012 | 2012 | 2013 | 2013 | 2014 | 2014 | 2015 | 2015 | 2015 |
|---|---|---|---|---|---|---|---|---|---|
| Knowledge Item | Pre-Program % Correct | Post-Program % Correct | Pre-Program % Correct | Post-Program % Correct | Pre-Program % Correct | Post-Program % Correct | Pre-Program % Correct | Post-Program % Correct | % Difference (2015 Post-Pre) |
| **Chemistry Science (E3.1.1.2)** | | | | | | | | | |
| 1. Sodium and chloride bond to form salt (NaCl). What does this bonded substance represent?'** | — | — | — | — | — | — | 55% | 80% | 25% |
| 5. Which of the following has properties similar to the properties of air? | — | — | — | — | 40% | 53% | 11% | 79% | 68% |
| 10. Which of the following is an example of physical change? | 31% | 57% | 33% | 61% | 35% | 55% | 33% | 67% | 34% |
| 14. Which of the following states of matter have the least amount of kinetic energy? | 46% | 72% | 51% | 73% | 36% | 62% | 37% | 65% | 28% |
| **Engineering (E3.1.1.4)** | | | | | | | | | |
| 2. By constructing a 3D scale model of a car, a person can learn all of the following EXCEPT:** | — | — | — | — | — | — | 37% | 54% | 17% |
| 3. Why are prototypes a key part of the engineering design process? | 56% | 68% | 56% | 69% | 64% | 77% | 67% | 80% | 13% |
| 11. When using computer design software to build a model, the first step is to:** | — | — | — | — | — | — | 41% | 62% | 21% |
| **Mathematics Operations & Applications (E3.1.1.5)** | | | | | | | | | |
| 4. Which of the following is typically measured in nanometers? | 40% | 72% | 38% | 71% | 41% | 69% | 38% | 71% | 32% |
| 9. In the graph above, find the letter that is at the coordinates (3,-2). Is it A, B, C, or D? | 49% | 69% | 48% | 67% | 49% | 66% | 45% | 65% | 20% |
| 12. Of the following, which tool would be appropriate to measure the volume of a glass of milk? | — | — | 39% | 60% | 53% | 75% | 54% | 80% | 26% |

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**Table 35: (Continued)**
**Pre/Post Knowledge Item Mean Percentage Correct**

| Knowledge Item | 2012 Pre-Program % Correct | 2012 Post-Program % Correct | 2013 Pre-Program % Correct | 2013 Post-Program % Correct | 2014 Pre-Program % Correct | 2014 Post-Program % Correct | 2015 Pre-Program % Correct | 2015 Post-Program % Correct | 2015 % Difference (2015 Post-Pre) |
|---|---|---|---|---|---|---|---|---|---|
| 15. An engineer is testing how well three different towels absorb liquids over three trials. The data for the experiment is in the table below. Select the graph that correctly represents the data of the experiment. | 55% | 69% | 54% | 69% | 55% | 67% | 57% | 70% | 12% |
| Physics (E3.1.1.1) | | | | | | | | | |
| 6. Two boats are floating by each other and passing cargo from one boat to the other. Based on Bernoulli's Principle, what happens if water is forced between the two boats? | 7% | 67% | 7% | 67% | 6% | 68% | 8% | 68% | 60% |
| 13. What scientific law makes it important to wear a seat belt? | 39% | 75% | 39% | 75% | 38% | 72% | 37% | 70% | 32% |
| Technology (E3.1.1.3) | | | | | | | | | |
| 7. You are working on a new product to melt snow and ice on walkways. You test the product by measuring the time it takes for the area to become safe for walking. What conclusion would you make based on the following results? | — | — | 60% | 71% | 59% | 71% | 60% | 71% | 12% |
| 17. You start out at the flag (coordinates -1, 3) and walk two kilometers North, then 1 Kilometer West and stop for lunch. After lunch, you head to your friend's house which is five kilometers to the East. Where does your friend live? | 46% | 63% | 46% | 62% | 59% | 70% | 62% | 75% | 12% |
| 8. Which of the following would be a good reason to use latitude and longitude coordinates? | — | — | 43% | 70% | 41% | 69% | 45% | 73% | 28% |
| STEM Awareness | | | | | | | | | |
| 16. STEM (Science, Technology, Engineering, and Math) jobs can involve which of the following?'** | — | — | — | — | — | — | 73% | 80% | 6% |

** Item content modified from last administration*

*** New item in 2015*

### *Gender Differences on Knowledge Test*

Table 36 presents the pre- and post-program scores and gap differences between scores, based on gender. Similar to several prior years, the pre-program knowledge score was significantly higher for boys than for girls. The average post-program knowledge score for boys is slightly higher than for girls, but is no longer statistically significant. By contrast, the knowledge increase from pre- to post- program is significant for both boys and girls.

**Table 36:**
**Pre/Post Knowledge Assessment Mean Scores by Gender**

| | Sample Size | Pre-Program Score | Post-Program Score* | Individual Gap Score |
|---|---|---|---|---|
| Boys | 626 | 7.80 | 12.11 | +4.31* |
| Girls | 625 | 7.44 | 12.08 | +4.64* |

**Significant difference between pre-program score and post-program scores.*

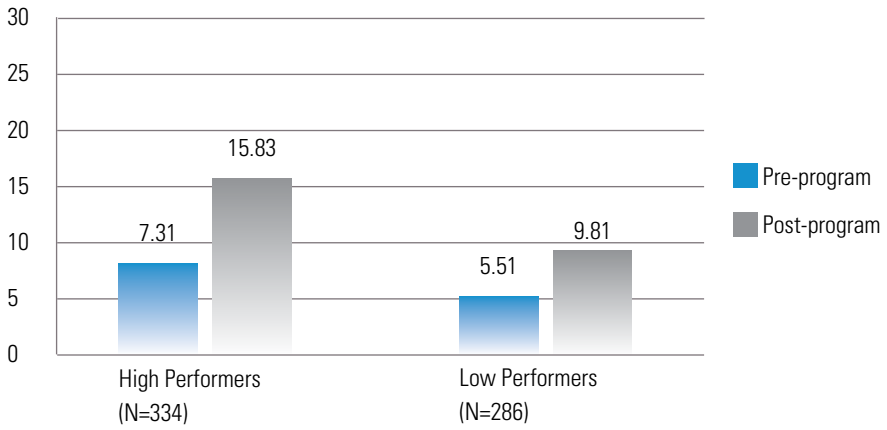
### *High versus Low Performers on Knowledge Test*

Figure 6 (see page 87) illustrates the differences between high and low performers on the pre- and post-program knowledge assessment. Performance was measured using the post-program total assessment score sample mean of 12.09 and standard deviation of 3.27. High performance was considered to be a total score of 15 or higher (12.09 + 3.27, rounded to whole unit value). A total of 26.6% of the sample was classified as high performers. Low performance was defined to be a total score of 9 or lower (12.09 - 3.27, rounded to whole unit value). A total of 22.8% of the sample was tagged as low performers.

Both the low and high performers showed significant improvements after participating in the DoD STARBASE program. Similar to the past several years' results, those students who scored low on the post-assessment also scored low on the pre-assessment and did not improve as much. The low performers' average gap score was a 4.30 point increase from pre- to post-program, compared to the high performers who improved on average by 8.52 points. The differences between the two groups in pre- and post-program total scores are statistically significant.

The pre- and post-program averages on the Attitudinal Survey overall were also lower for low Knowledge Assessment performers. The low performing group had a significantly lower mean attitude rating both pre- and post-program (5.02 and 5.31 respectively) as compared to the high performing group (5.42 and 5.83 respectively). Overall, both pre-program attitudes and post-program attitudes were significant predictors of post-program knowledge scores ($r = .175$, $r = .218$, respectively, both $p < .0001$).

**Figure 6:**
**High versus Low Performers on Knowledge Assessment**




*Perceptions of STEM Use in Jobs*

A pilot knowledge item in 2015 asked students "Who uses STEM concepts in their job? (Select all that apply)." Twenty five jobs were listed (Table 37), and the average number specified as STEM-related pre-program was 10.73 (SD = 5.21).

**Table 37:**
**High versus Low Performers**

| | | | | |
|---|---|---|---|---|
| Accountant | Camera operator | Farmer | Mail carrier | Police officer |
| Actor/actress | Car designer | Fireman | Maintenance worker | School counselor |
| Animal breeder | Crime scene investigator | Hair designer/ barber | Manager | Sports athlete |
| Architect | Construction worker | Housekeeper | Mechanic | Teacher |
| Nurse | Cook | Lawyer | Military personnel | Video game designer |

*Conclusion*

The 2015 DoD STARBASE program was successful in achieving its major goals as measured by the assessment of student attitudes and knowledge before and after attending the program. It produced measurable changes in students' positive attitudes toward science, technology, engineering and mathematics. Those positive attitudes are likely to be helpful in encouraging learning about STEM topics throughout the students' academic careers.

In addition, the 2015 DoD STARBASE program also yielded solid gains in students' STEM knowledge and performance. Students completed the program with an increase in STEM information and skills, which also should be of benefit in their continuing school learning about STEM topics. The increase in knowledge performance was particularly noticeable in girls, who have historically been less well prepared in the STEM domain than boys.

Finally, the DoD STARBASE program appears to have supported the DoD sponsor's community outreach objective by creating a favorable impression among many of the participating students of the U.S. military and the people who work for it.

## PARTICIPATING TEACHER ASSESSMENT

*Introduction*

The Teacher Survey gathers strategic and evaluative information about the DoD STARBASE program to determine overall impact with both immediate and lasting implications. Classroom teachers support their students throughout the DoD STARBASE experience and provide valuable insight before, during, and after the program ends. The teachers provide an understanding of their student population that includes a higher level of academic aspirations and support structures available to the students in general. The Teacher Survey provides a level of analytics that evaluates outcomes typically associated with successful programs including:

- Progress toward specific academic requirements (e.g., STEM concepts)
- Personal characteristics (e.g., confidence, motivation)
- Future planning (e.g., career opportunities within the Military and DoD)
- Key stakeholder program support (e.g., principals and parents)

Beginning in the year 2000, academies invited at least 10 teachers to complete the online Teacher Survey after their program ended. As the program evolved, teachers began completing the survey on the last day while the students completed their Student Surveys resulting in more teacher responses throughout the years.

In 2014, the Teacher Survey content was updated to include additional evaluation categories, realign other categories, and eliminate some items that were repetitious. With the implemented changes, the survey administration began one month later than in previous years. Fifty-five academies provided responses with 1,668 teachers completing the survey during September 2014 through June 2015. Fifty academies received ratings from more than 10 teachers with 23 academies receiving a sample of 30 or more completed surveys. Each academy that received teacher ratings received a report of their academy responses twice during the program year, once in February that included responses to date and again in July that included the entire academic year.

*Academy Characteristics*

The 55 academies with teachers participating in the survey were representative of four Military components across the United States. The National Guard hosted the majority of academies with 1244 (75%) teachers responding to the survey from 43 academies. The academies were representative across regions with about 50% located in the Midwest (16 academies) or the South (13 academies). Appendix G (page 137) provides the Region for each academy location. Listed below are the number of participating academies and sample sizes of teacher surveys for each region.

*Region*

16 Midwest (N=578)
13 South (N=416)
11 Southeast (N=296)
10 West (N=245)
5 East (N=133)

## DoD STARBASE TEACHER SURVEY ANALYSIS

*Demographic Information*

For the 2014-2015 academic year, 1,668 school personnel completed the online DoD STARBASE Teacher Survey. This represents an approximate 55% increase in total responses as compared to last year (1,076 completed surveys). The characteristics of the teachers completing the survey remain consistent from year to year. Table 38 includes the current year percentages for the teacher characteristics. The teachers represent a range of teaching experience with the largest percentage (38%) of respondents having over 15 years of experience. The majority of teachers (81%) taught mainly fifth grade with another 13% having taught the fourth (7%) or sixth (6%) grades. The remaining 'Other' response category includes those participants having taught multiple grades, are administrators with the school district, or work in specialized classrooms such as special education or counseling programs.

**Table 38:**
**Teacher Characteristics**

| Years Taught | Grade Taught | Age Range | Gender |
|---|---|---|---|
| 7% First year | 7% Grade 4 | 18% Under 30 Years | 83% Female |
| 13% 2-4 Years | 81% Grade 5 | 29% 31-40 Years | 17% Male |
| 11% 5-7 Years | 6% Grade 6 | 28% 41-50 Years | |
| 13% 8-10 Years | 6% Other Response *(e.g., Special class, assistant, all grades, administrator)* | 19% 51-60 Years | |
| 17% 11-15 Years | | 6% Over 60 Years | |
| 38% Over 15 Years | | | |

Four percent of the teachers (59 teachers from 20 academies) indicated that their school has participated since the program formalized over 15 years ago. In contrast, only 11 teachers (less than 1%) from nine academies reported having participated in the program for over 15 years. The majority of schools (73%) have participated in the program from two to 10 years. Conversely, the majority of teachers (77%) are new to the program (less than five years) with 39% indicating that this is their first year participating in a DoD STARBASE program.

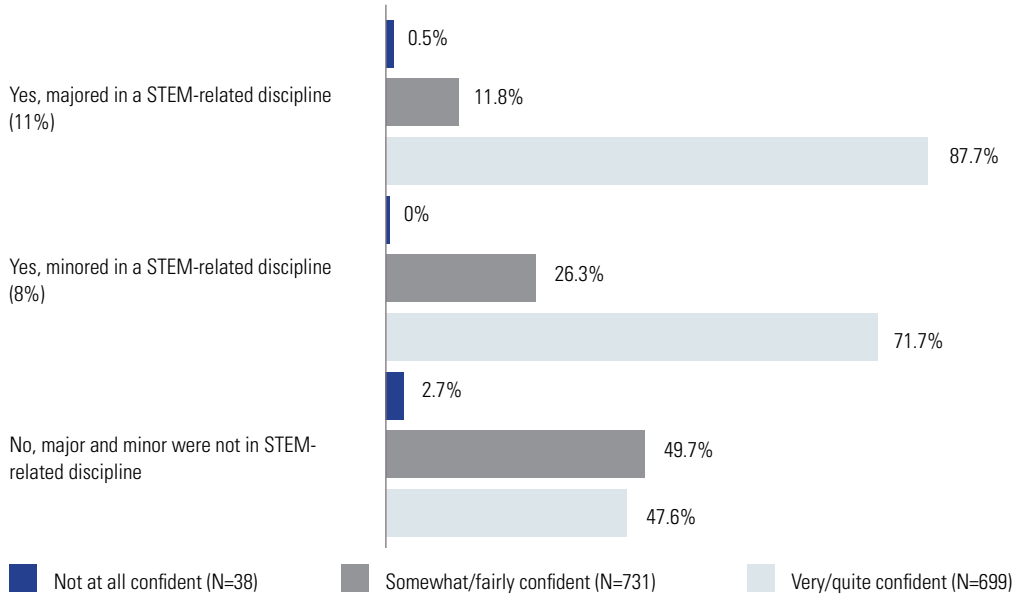
*STEM-Related Experience*

To evaluate familiarity with STEM topics, teachers were asked whether their college major and/or minor were in a STEM-related discipline. Eighty-one percent (N=1,354) of the teachers reported that their college major and minor were not in STEM-related disciplines. Of the remaining responses, 11% reported that their major was in STEM and 8% reported that they minored in a STEM-related discipline.

Teachers also provided their level of comfort with teaching STEM-related topics in the classroom. Overall, teachers are confident teaching STEM-related topics to their students with most reporting being Fairly (32%), Quite (37%) or Very (17%) Confident.

Having a degree in a STEM-related discipline provides teachers with more confidence in teaching STEM-related topics to their students. Those teachers who majored in a STEM-related discipline reported higher confidence with almost 88% indicating that they are Very or Quite Confident. In contrast, the majority of teachers (81%) did not major or minor in a STEM-related discipline and reported less confidence in teaching STEM-related topics (Figure 7). DoD STARBASE programs provide a valuable resource to teachers with limited background in STEM-related areas.

**Figure 7:**
**Major/Minor in STEM-Related Discipline by Confidence with Teaching STEM-Related Topics**




*Teacher Attitudinal Ratings*

Teachers rated 42 attitudinal items on a 7-point Likert scale from Disagree (1) to Agree (7) based on their experience with the DoD STARBASE program. The items were aggregated into an Overall Index and covered topics including the students' and teachers' attitudes involving program concepts such as understanding and enjoying the STEM program content, displaying confidence and motivation in classroom settings, and planning for future goals and careers.

The Teacher Survey content aligned with the 2014-2015 DoD STARBASE program goals and incorporated additional measurement elements. These elements provide more depth and understanding of the program impact on teachers and students during and after the program. The following table (Table 39) provides the concepts and definitions for each area measured. Additional details for each of the measurement areas are included in Appendix C. Student/Teacher Engagement is a composite of 32 item responses based on teachers' self-report of their attitudes and their perceptions of students' attitudes during the DoD STARBASE program. Engagement attitudes were grouped according to topic area (e.g., STEM Concepts, Program Support) to support aggregate ratings of most favorable to least favorable measurement area. Overall, teachers responded favorably to all measurement topics with the most favorable responses (above 6.00) to STEM Concepts, Program Support, Confidence, and Behavioral/Motivational areas.

The post-program Impact scale uses responses to 10 items completed by those teachers that have more than one year of experience with the DoD STARBASE program. Items included a broad range of post-program measures including students' interest in STEM topics, their career choice options, classroom attendance, and participation in STEM-related programs.

**Table 39:**
**Teacher Survey Measurement Areas**

| Measurement Area | Definition | No Items | Cronbach's Alpha* | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Student/ Teacher Engagement | Engagement shown while attending DoD STARBASE | 32 | .962 | 6.15 | .775 |
| STEM Concepts | Interest in and understanding of STEM concepts | 6 | .882 | 6.37 | .758 |
| Program Support | Support and resources provided to the teachers | 7 | .784 | 6.35 | .766 |
| Confidence | Confidence with abilities and capabilities | 3 | .864 | 6.12 | .918 |
| Behavioral-Motivational positive behaviors | Effort shown in reinforcing | 5 | .813 | 6.12 | .884 |
| Teamwork | Working with and supporting others | 3 | .918 | 5.99 | 1.043 |
| Future Planning | Seeing future possibilities and opportunities | 4 | .920 | 5.83 | 1.061 |
| Military and Career | Positive regard for Military personnel and career options | 5 | .746 | 5.78 | .940 |
| Post-program Impact | Lasting impact of DoD STARBASE after the program ends | 10 | .934 | 6.18 | .884 |

** Indicates measurement reliability in terms of internal consistency, or similarity, among contributing items. Values approaching or exceeding .90 reflect higher consistency; values below .70 suggest relatively more diverse subject content among items.*

### *DoD STARBASE's Impact on the School System*

The DoD STARBASE program influences students and teachers, but also impacts the school system overall, both formally and informally. As part of the Teacher Survey, teachers shared their knowledge of specific practices based on their participation in the program. Table 40 provides the favorable responses to five items. Two of the largest increases in positive responses involve the resources provided by DoD STARBASE (in the use of materials/applications in the classroom and take home activities). These items also translate into more favorable attitudes overall when comparing teachers' ratings.

**Table 40:**
**DoD STARBASE's Impact on the School System**

| Item | Positive (Yes) Responses |
|---|---|
| Updated wording in 2015 | 2015 |
| Is there formal communication from your school that raises community awareness of the DoD STARBASE program (e.g., letters to parents, overview at parent open house meetings, etc.)? | 62.8% |
| Will you recommend DoD STARBASE to other teachers, principals, or school educators? | 99.4% |
| In your view, does the DoD STARBASE curriculum help you reach your state education requirements? | 94.2% |
| Do you or will you use DOD STARBASE materials/applications in your own classroom? | 85.5% |
| Do you or will you use DoD STARBASE take home activities beyond your classroom? | 65.8% |

*School & Teacher Support and Teacher Attitudinal Ratings*

Program support includes support and advocacy of DoD STARBASE as well as the resources and support provided to the teachers. A school's plan to continue participation in the DoD STARBASE program next year (6.90) indicates the value that participating schools gain from student attendance in the program. Additionally, there is continued support from the teachers looking forward to future participation (6.79), parents that are delighted their children are participating (6.45), and principals that are strong advocates for the program in general (6.21) (Table 41).

An opportunity for development includes the supplemental resources that are available to the teachers. Teachers generally indicated that they would like to bring more supplemental resources from the DoD STARBASE program back to their classrooms (6.37) and they plan to incorporate some of the teaching techniques into their classroom activities (6.12). At the same time, however, there is a somewhat lower preference for DoD STARBASE resources over other similar resources (5.80).

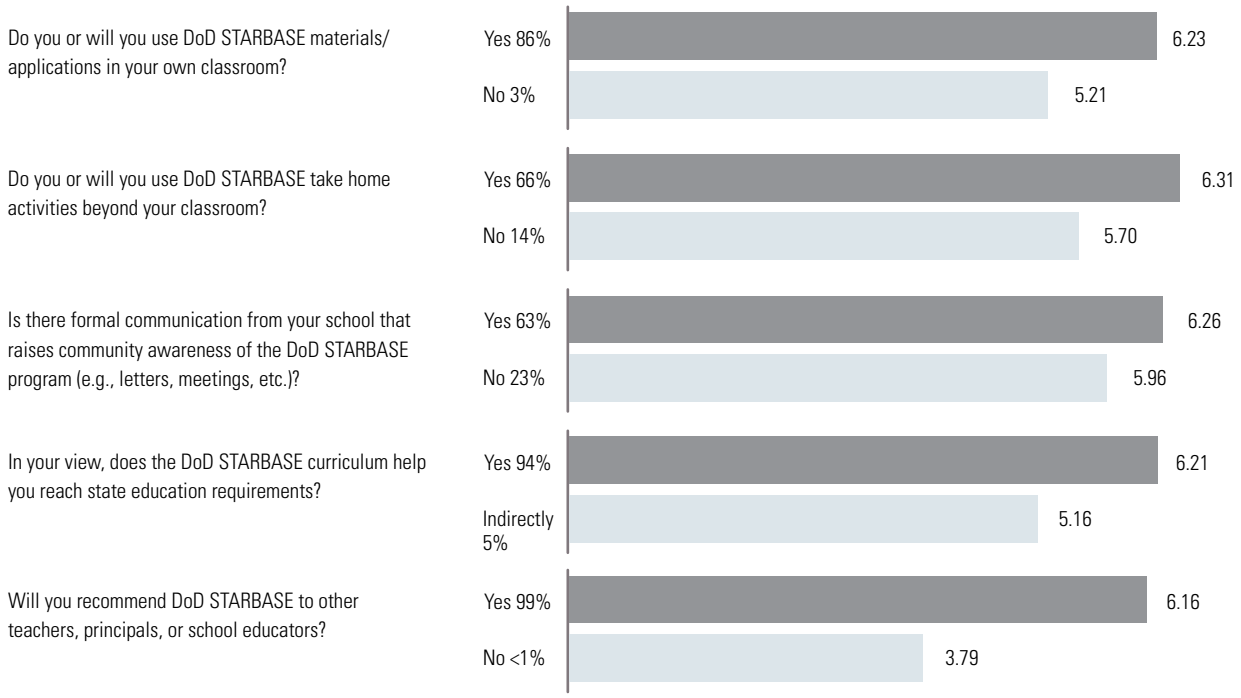
**Table 41:**
**Program Support Ranked from Most to Least Favorable**

| | Mean | Std. Deviation |
|---|---|---|
| My school plans to participate in the DoD STARBASE program again next year. | 6.90 | .593 |
| I look forward to bringing future classes to the DoD STARBASE program. | 6.79 | .710 |
| Parents are delighted that their children are participating in DoD STARBASE. | 6.45 | .961 |
| I would like more DoD STARBASE supplemental resources to take back to my classroom. | 6.37 | 1.136 |
| My principal is a strong advocate of DoD STARBASE. | 6.21 | 1.202 |
| I plan to incorporate DoD STARBASE teaching techniques into my daily classroom activities. | 6.12 | 1.236 |
| I prefer the supplemental resources DoD STARBASE provides to teachers over other similar resources. | 5.80 | 1.358 |

The Overall Index is an aggregate scale based on the mean or average of 42 attitudinal items. The Overall Index was compared based on responses to items ascertaining the level of support provided to the teachers. In all instances, those teachers who received support from the school and resource materials from their DoD STARBASE program responded with more favorable attitudes toward the DoD STARBASE program as a whole compared to those teachers with little or no perceived support. Table 42 shows the percent of responses to support items, and Overall Index mean according to response category (e.g., yes or no). Highlights of the specific outcome comparisons include:

- Teachers who use or plan to use DoD STARBASE resource material and take home activities have more favorable attitudes as measured by the Overall Index (6.23 and 6.31, respectively) compared to those who do not utilize these resources (5.21 and 5.70, respectively).
- Those teachers reporting that the DoD STARBASE curriculum directly helped them reach state education requirements have more favorable overall attitudes (6.21) compared to those reporting only an indirect relationship (5.16).
- Schools with formal communication processes in place had higher teacher ratings (6.26) on the Overall Index than those with no formal communication (5.96) processes in place.
- Teachers who would recommend the DoD STARBASE program responded with higher overall ratings (6.16) as compared to those who would not recommend the program (3.79).

**Table 42:**
**Attitude Ratings by DoD STARBASE Impact Items**



*Military Experience and Career Opportunities*

Teacher experience with military bases remained similar to the previous three years despite the differences in participation rates during the same time-period. The majority of teachers (75%) involved in the DoD STARBASE program this year have had some type of exposure to a military base either from prior DoD STARBASE programs only (14%), from non-related programs (35%), from a combination of DoD STARBASE and unrelated activities (20%) and 6% from other activities. One quarter of the teachers reported that this is their first experience with the DoD STARBASE program (Table 43).

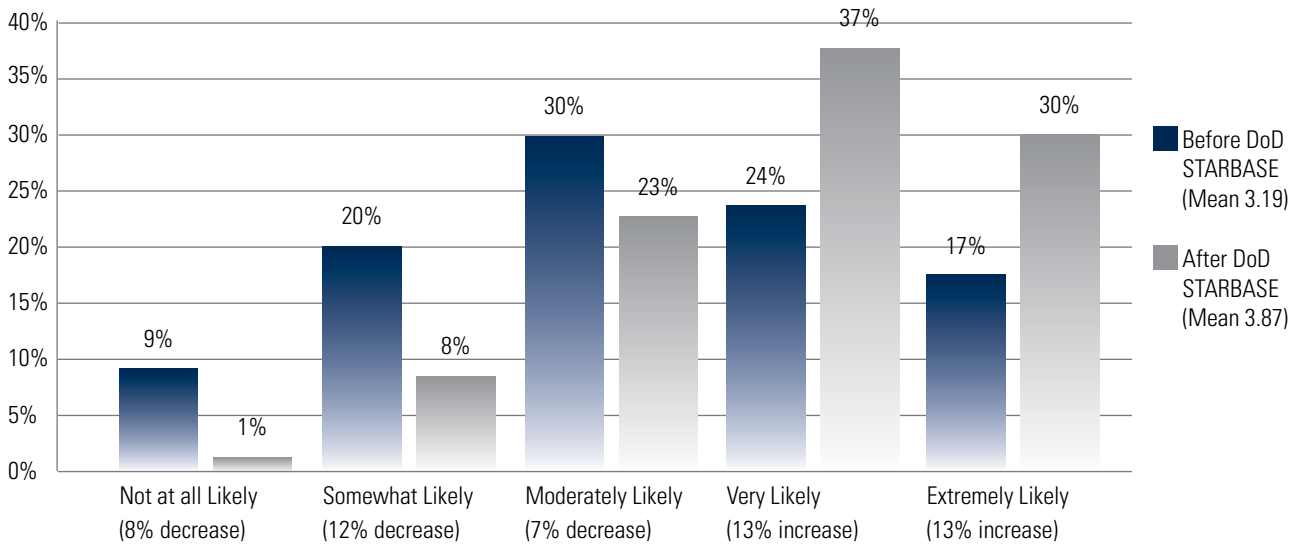
**Table 43:**
**Experience with a Military Base**

| | 2015 (N=1,668) | |
|---|---|---|
| Response | Frequency | % |
| Never visited a military base before the current DoD STARBASE Program | 424 | 25.4% |
| Yes, for prior DoD STARBASE programs only | 232 | 13.9% |
| Yes, for activities not related to DoD STARBASE | 590 | 35.4% |
| Yes, for DoD STARBASE and non-DoD STARBASE activities | 330 | 19.8% |
| Other[20] | 92 | 5.5% |

Eighty-eight percent (1,475) of the teachers reported that they are more aware of career opportunities (both uniformed and non-uniformed civilian) within the Department of Defense because of their participation in the DoD STARBASE program. Teachers also indicated how likely they are to recommend the DoD or the military as a career option both prior to and after their DoD STARBASE program. After the teachers participated in DoD STARBASE, 26% of them were more likely (Very or Extremely Likely) to recommend career options than prior to their participation (41% pre-program versus 67% post-program). Figure 8 illustrates the shift in favorability based on percentage of responses within each of the response categories. A total of 67% of all teachers were Very likely (37%) or Extremely likely (30%) to recommend the military or DoD civilian careers after the program as compared to a total of only 41% before the program (24% and 17%, respectively).

[20] The majority of the "Other" responses include having family members either on active duty or inactive/retired from the military, with a few attending a base for an aviation festival or an air show, or teaching at a school on a military facility.

**Figure 8:**
**How likely are you to recommend the DoD or the military as a career option to your students?**

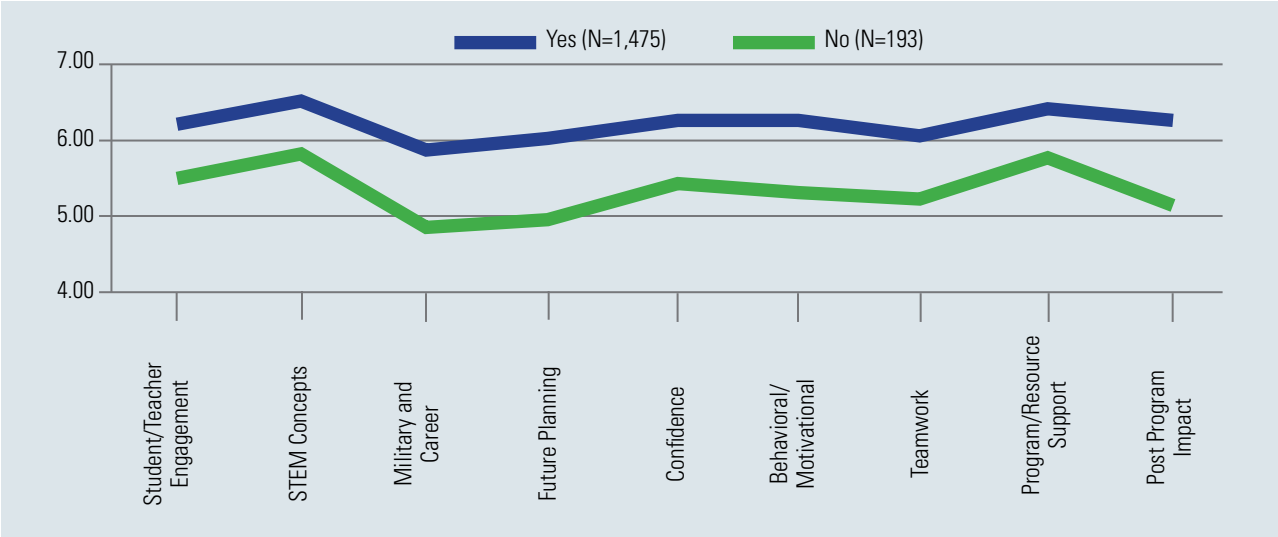



*5-point Likert scale*

Additionally, the 88% that reported being more aware of uniformed and non-uniformed civilian career opportunities after the program also reported higher responses in all areas of measurement (Figure 9).
Of particular interest is the greater recognition of beneficial post-program impacts on students. The most significant differences occurred in the following behaviors:

- Better school attendance
- Increased participation in the Science Fair and other STEM-related challenge programs (e.g., FIRST LEGO League, Odyssey of the Mind, Team America Rocket Competition, etc.)
- Better performance on standardized state assessments
- Ability to link their experience to careers in both military and non-military positions
- More interested in using computers for class-related learning activities
- Asking more questions about technology
- Improved cooperative learning in the classroom even after the program ended

**Figure 9:**
**Teacher Perceptions of Student Behavior Based on More Awareness of Department of Defense Career Opportunities after Attending DoD STARBASE**




*Teacher Attitudinal Ratings Toward STEM Awareness*

Teacher attitude toward STEM awareness was measured by four items with a focus on interest in the STEM areas and two items specific to learning about science and math (Table 44). Similar to previous years, concepts related to science were rated higher than math. Specifically, students were more interested in science (6.46) compared to math (5.93) according to teacher perceptions and had improved understanding of science (6.64) compared to appreciation of how math can be applied (6.49). Even so, students' reported interest in and appreciation of math was greater than in previous years, attaining the highest averaged ratings seen so far. On the other hand, student interest in learning about science saw a small decline from the established steady trend of the past few years.

Two new items this year included interest in learning about technology and engineering. The current trend is toward more interest by students in learning about technology followed by science, engineering and math, based on teachers' ratings. Leveraging technology advancements and interest in technology is relevant when engaging students in other STEM awareness programs for math, science or engineering.

**Table 44:**
**Teacher Attitude Toward STEM Awareness**

| | 2015 |
|---|---|
| DoD STARBASE has helped to improve the students' understanding of science | 6.64 |
| More interested in learning about technology | 6.51 |
| DoD STARBASE has helped to improve students' appreciation of how math can be applied to a variety of situations | 6.49 |
| More interested in learning about science | 6.46 |
| More interested in learning about engineering | 6.17 |
| More interested in learning about math | 5.93 |

Teachers are oftentimes the best resource for identifying additional development activities that are best suited to their students' learning styles. Teachers provided their opinion on the best way to continue developing their students' interest in STEM-related activities. Seventy percent indicated that the best way to continue interest is to promote an existing program (30%) or a new program (40%) in the school system. The least likely ways to increase awareness in the teachers' view included promoting a new program at the national, state, or community level (20%) or through an existing community-based program (10%). The DoD STARBASE program provides a unique opportunity to students and teachers by utilizing the school system to access DoD/Military personnel and civilian instructors with specialized training in STEM-related topics. By continuing to nurture its relationship with the teachers and the school system, the DoD STARBASE program can continue to support students' interest in STEM-related activities.

**Table 45:**
**Developing Interest in STEM-Related Activities**

| Best way to develop continuing interest in STEM-related activities | Frequency | Percent |
|---|---|---|
| Promoting a new program in the school system | 672 | 40% |
| An existing school-based program | 498 | 30% |
| Promoting a new program at the national, state, or community level | 332 | 20% |
| An existing community-based program | 166 | 10% |

Teachers provided information regarding community programs, extra-curricular activities, and available resources and/or equipment within the school in order to promote student access and interest in STEM concepts (Table 46). Responses tended to vary by question, but provide some insight into the different programs available both within the school system and in the community at large. Resources and programs that promote STEM awareness and interest are limited. Sixty-nine percent of the teachers report either no relevant (25%) or only a couple of relevant (44%) school or community programs that further develop students' STEM awareness beyond the DoD STARBASE program. When asked specifically about community extra-curricular programs, 48% are not sure and 17% report no programs or activities that are grade-level appropriate for their students.

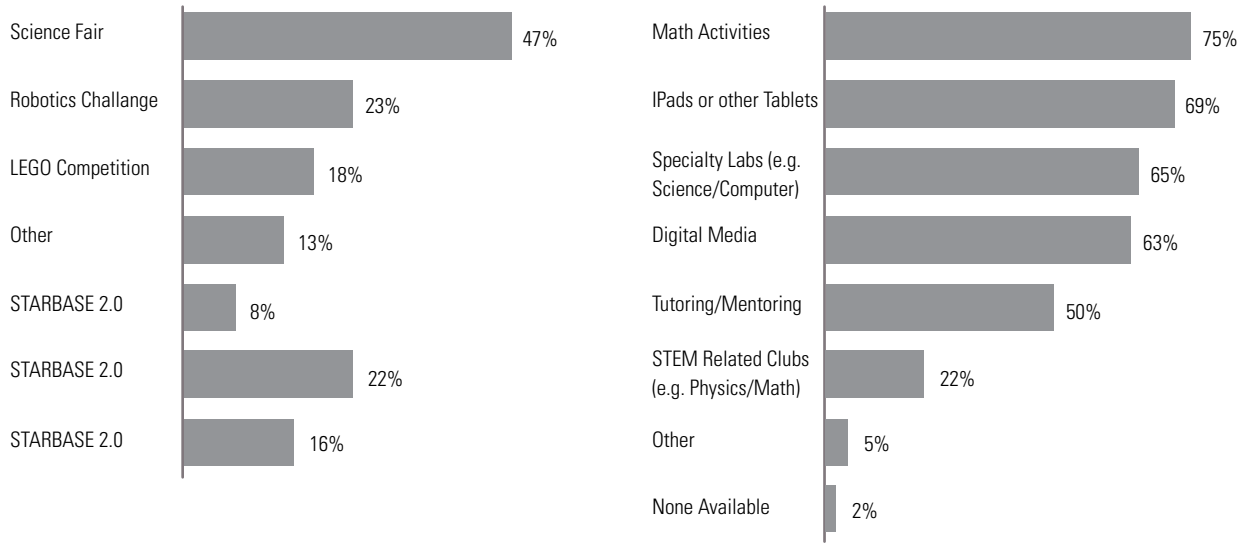
**Table 46:**
**STEM-Related School or Community Resources and Extra-Curricular Programs/Activities**

| Other resources in the school or community to further develop my students' STEM awareness beyond DoD STARBASE include... | Does your community have extra-curricular programs and/or activities for stimulating STEM interest aimed at middle school aged students? |
|---|---|
| 44% only a couple of relevant programs | 48% Not sure |
| 25% no other relevant programs | 35% Yes |
| 17% several relevant programs | 17% No |
| 14% many relevant STEM awareness programs | 10% |

Teachers identified specific STEM awareness programs, activities, resources and equipment available to students within the school system and the community at large. Thirty-eight percent of the teachers indicate that either there are no available (16%) or no planned (22%) organized STEM awareness programs, activities or resources for their students after attending the DoD STARBASE program (Figure 10).

- 62% identified an organized activity, program or other resource for their students after DoD STARBASE has ended (e.g., Science Fair, Robotics challenge).
- 98% report there are resources and/or equipment available in school for students to use (e.g., Math activities, Specialty labs).

**Figure 10:**
**Organized STEM Programs and Available Resources for Students**



It is important that teachers and educators have post-DoD STARBASE programs available to continue to engage the students after the program has ended. Referring students to additional STEM-related programs or resources after DoD STARBASE is dependent upon availability and appropriateness to the student population. Ninety-three percent of the teachers plan to always (46%), often (33%), or sometimes (14%) refer students to additional STEM-related programs or resources after the DoD STARBASE program has ended (Table 47). The high percentage of teachers referring students suggests that the teachers understand the importance of continuing STEM-related interest beyond the classroom setting regardless of whether the program is supported through the school or community at large.

**Table 47:**
**Percent of Teachers Likely to Refer Students to STEM-Related Programs or Resources**

| I plan to refer students to additional STEM-related programs or resources after DoD STARBASE. | Frequency | Percent |
|---|---|---|
| Always | 771 | 46% |
| Often | 557 | 33% |
| Sometimes | 239 | 14% |
| Once or twice | 29 | 2% |
| Not at all | 16 | 1% |
| Other responses* | 56 | 3% |

** Other responses included additional suggestions for more after school programs and willingness to refer if programs were available.*

"You cannot go wrong teaching our youth about science and engineering. You are only investing in the future of our country. I cannot emphasize the importance of this program to our youth enough!"

Parent of a student at DoD STARBASE One, Selfridge, MI

*Drivers of Target Ratings*

Stepwise multiple regression analyses were performed to determine the important drivers of key teacher attitudes and ratings about DoD STARBASE[21]. The key teacher ratings selected this year focus on program impact and engagement attitudes. The first regression analysis evaluated the post-program impact based on student and teacher engagement attitudes. Post-program impact was a composite scale calculated using 10 items completed by teachers with more than one year of experience participating in the DoD STARBASE program. This composite scale was regressed using the core items administered to all teachers evaluating their attitudes in relation to the 32 engagement survey items.

The drivers for each regression are listed in order of magnitude and oftentimes provide a comprehensive listing for identifying actions that most influence program effectiveness. The drivers listed for the post-program Impact aggregate scale explain approximately 74% of the variance, or variability, across teachers in their perceptions of DoD STARBASE impact (as indicated by the R2 value of .737). That is, these items predict individual teacher opinion about the program's impact on students with a high degree of efficiency. Thus, they provide a condensed model from which to tell how teachers feel about its value. The more drivers that are answered favorably or affirmatively, the more likely it is that a teacher holds a strongly positive viewpoint of the program impact.

**Drivers of Post-Program Impact[22] (R2 = .737)**

- While attending DoD STARBASE, the students appear to focus more on their future potential.
- I plan to incorporate DoD STARBASE teaching techniques into my daily classroom activities.
- During DoD STARBASE, students have better school attendance.
- The students appear more interested in learning about technology.
- The DoD STARBASE experience has influenced me to become skilled in STEM instruction.
- The students appear more ready to set future educational and career goals.
- DoD STARBASE has helped to improve students' appreciation of how math can be applied to a variety of situations.
- I prefer the supplemental resources DoD STARBASE provides to teachers over other similar resources.
- The students appear more comfortable with military personnel.
- The students appear more goal oriented.
- The students appear more interested in learning about engineering.
- The students appear more interested in learning about military careers.

Table 48 provides a summary of the regression analyses for key target ratings based on all attitudinal items within the teacher survey. The target ratings used in the regression analysis focused on future career opportunities. The target ratings are based on estimates of teachers' perceived student outcomes, or gains made by students on specific items. The predictive models selected for analysis this year focus on students' attitudes about future career opportunities and their understanding of how STEM-related skills and abilities link to various career paths.

[21] A definition of multiple regression and other statistical techniques used in this report are provided in the Appendix.

[22] The items making up this scale were not included in the regression analysis.

The DoD STARBASE program helps students understand their potential. Specifically, the regression analyses identified several areas that had the most impact across many of the target attitudes including, but not limited to, the following:

- Linking the students' experience to careers in both military and non-military positions
- Helping students understand better how STEM skills/abilities fit job requirements for certain career fields
- Helping students understand better that developing their current skills/abilities is necessary to have good future career choices
- Using computers for class-related learning activities
- Facilitating interest in engineering and science
- Providing information about military and non-military career opportunities
- Creating excitement about their future potential and how to set educational and career goals
- Reinforce positive behaviors such as cooperating with each other during program activities

**Table 48:**
**Drivers of Key Target Ratings**

| Drivers of "Attending DoD STARBASE helps students link their experience to careers in both military and non-military positions" (R2 = .721) |
|---|
| Attending DoD STARBASE helps students understand better how STEM skills/abilities fit job requirements for certain career fields. |
| More interested in learning about military careers |
| Attending DoD STARBASE helps students understand better that developing their current skills/abilities is necessary to have good future career choices. |
| I would like more DoD STARBASE supplemental resources to take back to my classroom |
| More interested in learning about science |
| More ready to set future educational and career goals |
| Students that have attended DoD STARBASE seem to perform better on standardized state assessments. |
| Better at following directions |
| More interested in learning about math |
| **Drivers of "Attending DoD STARBASE helps students understand better how STEM skills/abilities fit job requirements for certain career fields" (R2 = .736)** |
| Attending DoD STARBASE helps students understand better that developing their current skills/abilities is necessary to have good future career choices. |
| Attending DoD STARBASE helps students link their experience to careers in both military and non-military positions. |
| DoD STARBASE has helped to improve students' appreciation of how math can be applied to a variety of situations. |
| I plan to refer students to additional STEM-related programs or resources after DoD STARBASE. |
| More interested in learning about engineering |

*Continued on next page*

More interested in learning about military careers

To focus more on their future potential

More ready to set future educational and career goals

I look forward to bringing future classes to the DoD STARBASE program.

After DoD STARBASE attendance, there is increased participation in the Science Fair and other STEM-related challenge programs (e.g., FIRST LEGO League, Odyssey of the Mind, Team America Rocket Competition, etc.).

During DoD STARBASE, students have better school attendance.

Drivers of "Attending DoD STARBASE helps students understand better that developing their current skills/abilities is necessary to have good future career choices" (R2 = .769)

Attending DoD STARBASE helps students understand better how STEM skills/abilities fit job requirements for certain career fields.

Attending DoD STARBASE helps students link their experience to careers in both military and non-military positions.

DoD STARBASE reinforces many positive behaviors I try to teach my students.

The DoD STARBASE experience has influenced me to become skilled in STEM instruction.

More excited about their futures

More willing to cooperate with each other

After DoD STARBASE, students are more interested in using computers for class-related learning activities.

My principal is a strong advocate of DoD STARBASE.

More interested in learning about engineering

More ready to set future educational and career goals

More interested in learning about science

Have more questions about DoD and other non-military career opportunities

Students that have attended DoD STARBASE seem to perform better on standardized state assessments.

Better at working in groups

The students talk about DoD STARBASE long after the program has ended.

Drivers of "Students are more interested in learning about military careers" (R2 = .736)

To have more questions about DoD and other non-military career opportunities

More excited about their futures

More comfortable with military personnel

More ready to set future educational and career goals

Attending DoD STARBASE helps students link their experience to careers in both military and non-military positions.

Attending DoD STARBASE helps students understand better how STEM skills/abilities fit job requirements for certain career fields.

| Drivers of "Students are more ready to set future educational and career goals" (R2 = .831) |
|---|
| Focus more on their future potential |
| More interested in learning about engineering |
| More goal oriented |
| Attending DoD STARBASE helps students link their experience to careers in both military and non-military positions. |
| More interested in learning about military careers |
| After DoD STARBASE, students have better school attendance. |
| I plan to incorporate DoD STARBASE teaching techniques into my daily classroom activities. |
| DoD STARBASE helped to improve cooperative learning in the classroom even after the program ended. |
| More excited about their futures |
| More comfortable with military personnel |
| Attending DoD STARBASE helps students understand better how STEM skills/abilities fit job requirements for certain career fields. |
| Attending DoD STARBASE helps students understand better that developing their current skills/abilities is necessary to have good future career choices. |
| DoD STARBASE reinforces many positive behaviors I try to teach my students. |
| Students that have attended DoD STARBASE seem to perform better on standardized state assessments. |

| Drivers of "Students seem to focus more on their future potential after DoD STARBASE" (R2 = .837) |
|---|
| More ready to set future educational and career goals |
| More excited about their futures |
| Have more questions about DoD and other non-military career opportunities |
| More comfortable making decisions |
| Attending DoD STARBASE helps students understand better how STEM skills/abilities fit job requirements for certain career fields. |
| More willing to cooperate with each other |
| More willing to try new things |

*Continued on next page*

| Drivers of "Students seem to have more questions about DoD and other non-military career opportunities after DoD STARBASE" (R2 = .705) |
|---|
| More interested in learning about military careers |
| Focus more on their future potential |
| More interested in learning about engineering |
| After the DoD STARBASE program, the students ask more questions about technology. |
| After DoD STARBASE, students are more interested in using computers for class-related learning activities. |
| I prefer the supplemental resources DoD STARBASE provides to teachers over other similar resources. |
| The students talk about DoD STARBASE long after the program has ended. |
| My school plans to participate in the DoD STARBASE program again next year. |

## CONCLUSIONS

The DoD STARBASE program continues to provide participating students with STEM awareness activities that support student achievement overall, and in STEM related concepts specifically. As reported by teachers, participation in the Department of Defense program appears to create an excitement within the students about their careers and future potential that may not be available otherwise. Specifically, teachers with more than one year of experience with the DoD STARBASE program report that the students[23]:

- Talk about DoD STARBASE long after the program ended (6.60)
- Understand better how STEM skills/abilities fit job requirements for certain career fields (6.57)
- Understand better that developing their current skills/abilities is necessary to have good future career choices (6.52)
- Link their experience to careers in both military and non-military positions (6.32)

Students are able to participate in activities with DoD sponsored instructors that share specialized training in STEM concepts allowing the students to link the concepts to 'real-world' applications. Teachers value the DoD STARBASE program to provide awareness of and hands on experience in STEM concepts that can reinforce positive attitudes and behaviors. Additionally, the program emphasizes the importance of setting goals and looking forward to career opportunities often overlooked as typical career paths for students in elementary grades. Finally, the DoD STARBASE program provides teachers with additional resources and support. This is particularly important for the teachers that may not have the background or formal education and training in STEM fields (only 19% of the teachers indicated having a major or minor college degree in a STEM-related field).

[23] Likert scale based on response options from 1 (Disagree) to 7 (Agree).


"DoD STARBASE exposes students to several STEM and Military careers which is good motivation to do well in school and to strive for a great career. Overall, DoD STARBASE provides students with opportunities, experiences and fun that may not be offered in the classroom or at home."

Teacher participating at DoD STARBASE Arizona, Tucson, AZ

# Considerations for the 2016 Program Year

The annual report traditionally concludes with a proposed list of "considerations" on all aspects of the program operation, delivery, research applications, and new program initiatives. The objective of this section is to guide planned and purposeful improvement in every dimension of the program. Therefore, it is important that considerations are obtained from multiple sources. They include the views of key participants, such as the classroom teachers, school administrators, military base personnel, base commanders, DoD STARBASE staff, students, volunteers, and interested observers of the program.

The assessment process captures valuable information from each of these key participant groups through surveys, reports on operational activities, after-action investigations, compliance activities, academy visitations, reviews of academy documents, observations of program activity, and special ad-hoc studies on newly established initiatives. The "considerations" dimension explains the implications of this data for program applications and the potential for improving operational activities.

This year, as in the past, the considerations and challenges are positioned and designed to be supportive of improving program operations, practices, policy implementation, and the integration with national strategic initiatives. The key "considerations" include:

## Outreach

*Collaborations with Other STEM Programs*

- Continue pursuit of STEM collaborations with other community, state and national STEM organizations to create a STEM pipeline for participating DoD STARBASE students and to expand knowledge of the DoD STARBASE program and its role in raising awareness of STEM in regard to the future needs of our nation.
- Focus on STEM programs with the highest potential for collaboration. Consider a visitation by DoD STARBASE students to the program and/or invite them to the DoD STARBASE academy for a presentation to the students of the collaborative programs' activities.
- Each DoD STARBASE location should develop a complete, vetted inventory of STEM programs in its community. Share the inventory with key participants. i.e. schools, partnerships, military base public relations officer, collaborative partners, etc.
- Review Memorandum of Understanding (MOU) protocols for collaborations and develop a standard for nationwide academy use.

*Public Relations*

- Develop a set of materials for directors to use to promote DoD STARBASE. Provide training and a communication strategy to enable the appropriate and effective use of these materials.
- Provide all DoD STARBASE sites a current list of national program "key facts" to insure consistent messaging in all publicity for the program.

*Classroom Teachers*

- Provide participant orientation for all classroom teachers who intend to bring their students to DoD STARBASE. Orientation should include:
  - Participation and operational expectations while at the DoD STARBASE facility to include student discipline and teacher involvement in classroom activities.
  - Emphasis on timely arrival and departure times for students to insure the DoD STARBASE requirements of five classroom contact hours per day is met. This may require increased participating teacher interaction with transportation providers and school administrative staff as well as involvement of the DoD STARBASE director.

## Program Operations

- Begin the conversion of all DoD STARBASE programs to a full-12 month operation.
- Coordinate/Schedule with schools in advance to increase the number of students served. Each DoD STARBASE location should serve a minimum of 28 classes per year with a minimum of 20 students per DoD STARBASE class.
- Identify potential new student pools to insure full scheduling of DoD STARBASE resources.
- Continue pursuit of the addition of VTC/SKYPE capabilities for disseminating information via conference calls.
- Establish new DoD STARBASE programs in underserved locations.
- Develop and release new DoDI to document and provide current program guidelines.
- Reinstate annual DoD STARBASE directors and staff training conferences.
- Continue pursuit of partnerships and linkages with non-profit organizations to allow DoD STARBASE to benefit from additional community support and partnerships in an official (and tax deductible) capacity.
- Develop full evaluation criteria for Level III programs.
- Identify those academies that consider themselves in a Level III status and validate their status through site visitation assessment.

## Curriculum

- Communicate the linkage of the DoD STARBASE curriculum to national, state and local standards to participating classroom teachers and school administrators.

## DoD STARBASE 2.0

- Continue expansion of DoD STARBASE 2.0 program to include formalized partnerships with other outside-school youth programs (i.e. Big Brothers/Big Sisters, local clubs, museums, etc.) to leverage existing resources and reinforce the STEM-based 2.0 program as an active and integral part of the community.
- Continue efforts to increase the volunteer mentor pool to enhance community buy-in to DoD STARBASE 2.0 as a model after-school STEM Program.
- Consider the addition of high-school age "Junior Mentors" for middle school students. High school students would benefit from community service hours and middle school students from older student leadership. This would be in conjunction with and under close supervision of adult mentors.

"Our family believes in these extra programs with tenacity. We are in need of more of these programs to help our children not only learn about the sciences but spark interest or a directional hand to help point the way for them with a choice of a career. More of these DoD STARBASE experiences are needed for our children to gain not only more useful knowledge about math and science but future career choices. We as a country are failing in these areas and are getting passed by other countries. Statistics show that many of these countries start off their youth with educational programs that focus on or use a solid background in math and science. We need to do the same. This program is a fundamental and successful step in the right direction."

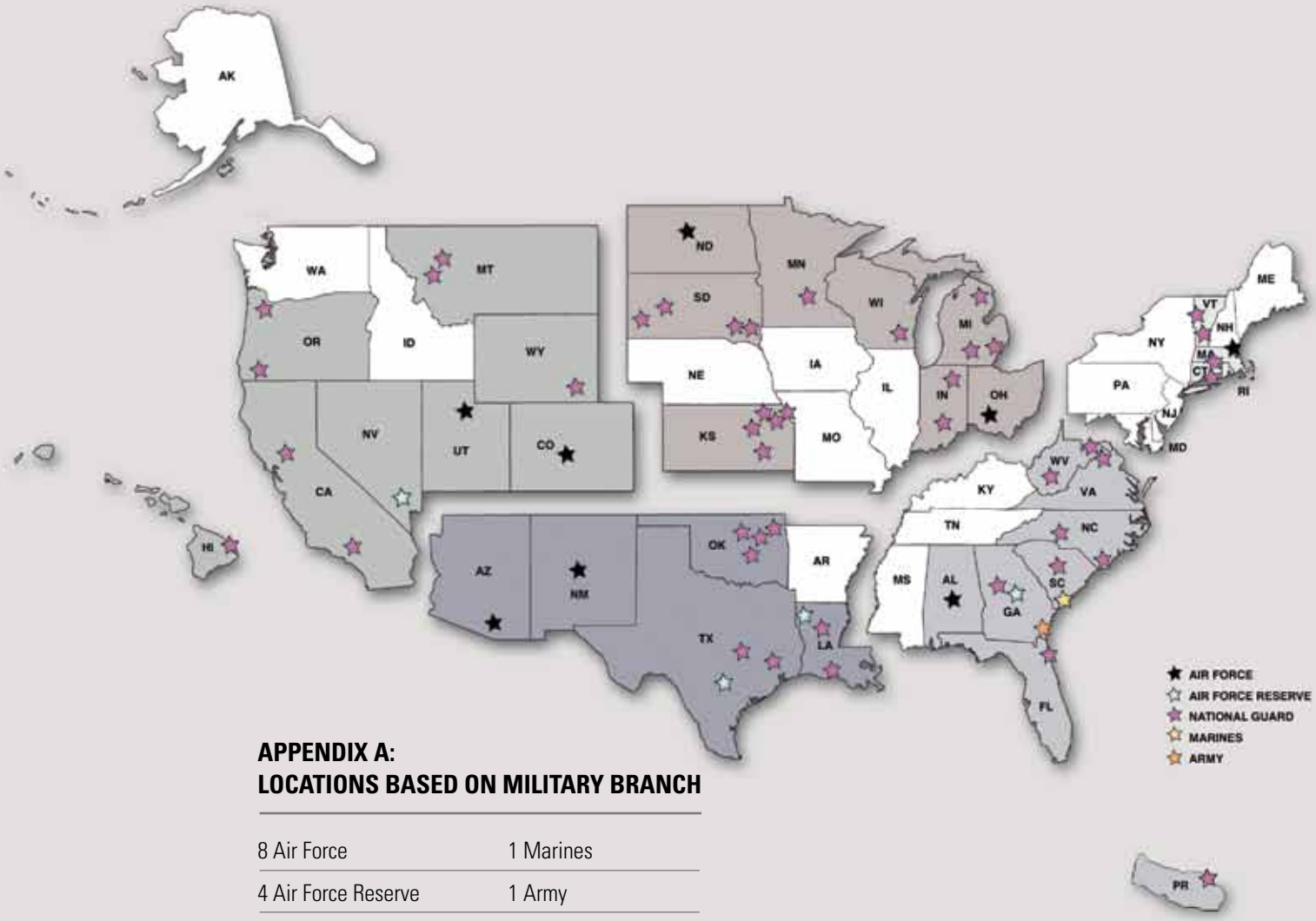
Parent of a student at DoD STARBASE Alpena, Alpena, MI

DoD STARBASE
A Department of Defense Youth Program

# 2015 DoD STARBASE APPENDICES

"DoD STARBASE is a high quality, STEM-rich program that our students look forward to every year. Each year it is a pleasure to bring students, and participants remember the experience for years."

Teacher participating at DoD STARBASE Arizona, Tucson, AZ




## APPENDIX A: LOCATIONS BASED ON MILITARY BRANCH

| | |
|---|---|
| 8 Air Force | 1 Marines |
| 4 Air Force Reserve | 1 Army |
| 44 National Guard | |

"This experience makes me feel that our children are getting an education that will stimulate their interest in science and technology that is needed in the US to maintain our world standing in innovative design and production methods."

Mark Hecht, Parent of a participating student at DoD STARBASE Kansas, Topeka, KS

**Appendix B:**
**Expressed Attitudinal Differences by Gender**

| | | Pre STARBASE | Post STARBASE | Individual Gaps |
|---|---|---|---|---|
| | | Mean | Mean | Mean |
| I am good at science. | Boy | 5.27 | 5.47 | 0.20 |
| | Girl | 5.08 | 5.42 | 0.34 |
| Learning about science is easy for me. | Boy | 4.89 | 5.18 | 0.29 |
| | Girl | 4.81 | 5.11 | 0.30 |
| I would like to join a science club at my school. | Boy | 3.93 | 4.02 | 0.08 |
| | Girl | 3.91 | 4.09 | 0.17 |
| I am interested in being a scientist or engineer. | Boy | 4.33 | 4.81 | 0.48 |
| | Girl | 3.59 | 4.16 | 0.56 |
| Military bases are exciting. | Boy | 6.04 | 6.14 | 0.10 |
| | Girl | 5.56 | 5.82 | 0.26 |
| I am good at math. | Boy | 5.48 | 5.59 | 0.11 |
| | Girl | 5.34 | 5.36 | 0.02 |
| I want to learn more about technology. | Boy | 5.95 | 6.01 | 0.06 |
| | Girl | 5.47 | 5.61 | 0.14 |
| I like technology. | Boy | 6.07 | 6.17 | 0.10 |
| | Girl | 5.76 | 5.91 | 0.15 |
| I would like a job in a science-related area. | Boy | 4.14 | 4.58 | 0.44 |
| | Girl | 3.94 | 4.46 | 0.51 |
| STEM jobs are exciting. | Boy | 4.91 | 5.44 | 0.53 |
| | Girl | 4.89 | 5.39 | 0.49 |
| Engineers help solve challenging problems. | Boy | 5.48 | 5.92 | 0.44 |
| | Girl | 5.25 | 5.72 | 0.47 |
| A military base is a good place to work. | Boy | 5.22 | 5.52 | 0.30 |
| | Girl | 4.95 | 5.33 | 0.38 |
| I like science. | Boy | 5.48 | 5.54 | 0.06 |
| | Girl | 5.41 | 5.60 | 0.19 |
| I would take engineering classes if offered. | Boy | 4.91 | 5.30 | 0.39 |
| | Girl | 4.18 | 4.59 | 0.41 |
| I would take classes on technology if available. | Boy | 5.46 | 5.57 | 0.11 |
| | Girl | 4.79 | 5.08 | 0.30 |
| I am aware of some STEM careers. | Boy | 4.75 | 5.52 | 0.77 |
| | Girl | 4.89 | 5.65 | 0.76 |
| I would like to take more math classes. | Boy | 4.49 | 4.60 | 0.11 |
| | Girl | 4.62 | 4.69 | 0.07 |
| I like engineering. | Boy | 5.22 | 5.66 | 0.44 |
| | Girl | 4.42 | 5.10 | 0.67 |
| Most people use STEM skills every day. | Boy | 5.32 | 5.92 | 0.61 |
| | Girl | 5.40 | 5.95 | 0.55 |
| I want to learn more about engineering. | Boy | 5.23 | 5.53 | 0.30 |
| | Girl | 4.63 | 5.01 | 0.39 |

*Continued on next page*

**Appendix B: (Continued)**
**Expressed Attitudinal Differences by Gender**

| | | Pre STARBASE | Post STARBASE | Individual Gaps |
|---|---|---|---|---|
| | | Mean | Mean | Mean |
| I like math. | Boy | 5.05 | 5.21 | 0.16 |
| | Girl | 5.14 | 5.11 | -0.03 |
| I would like to take more science classes. | Boy | 4.87 | 4.87 | 0.00 |
| | Girl | 4.95 | 4.95 | 0.00 |
| I enjoy learning about STEM topics. | Boy | 5.04 | 5.50 | 0.46 |
| | Girl | 5.01 | 5.44 | 0.42 |
| People who work on a military base do lots of different things. | Boy | 6.18 | 6.25 | 0.07 |
| | Girl | 6.07 | 6.16 | 0.09 |
| When I finish school, I would like to get a job | Boy | 4.85 | 5.28 | 0.43 |
| where I could use STEM. | Girl | 4.71 | 5.06 | 0.35 |
| I think learning about STEM topics will help me in my daily life. | Boy | 5.40 | 5.82 | 0.42 |
| | Girl | 5.48 | 5.82 | 0.34 |
| I like figuring out how to use technology gear | Boy | 6.26 | 6.36 | 0.09 |
| (tablets, smart phones,etc.). | Girl | 6.04 | 6.11 | 0.07 |
| I do not think DoD STARBASE will help me do | Boy | 6.30 | 6.52 | 0.22 |
| better in school. (Reversed Scored) | Girl | 6.36 | 6.41 | 0.05 |
| Scientists work on things that will make life better. | Boy | 5.93 | 6.10 | 0.18 |
| | Girl | 5.89 | 6.05 | 0.15 |
| I need to do well in math to get the kind of job I want. | Boy | 5.63 | 5.67 | 0.03 |
| | Girl | 5.56 | 5.70 | 0.14 |
| People who work for the military use technology in their jobs. | Boy | 6.04 | 6.30 | 0.26 |
| | Girl | 5.66 | 5.97 | 0.32 |
| I have enjoyed coming to a military base. | Boy | | 6.53 | |
| | Girl | | 6.45 | |
| DoD STARBASE Instructors made learning | Boy | | 6.38 | |
| about STEM topics fun. | Girl | | 6.37 | |
| DoD STARBASE is boring. (Reversed Scored) | Boy | | 6.57 | |
| | Girl | | 6.47 | |
| At DoD STARBASE, I learned a lot of things that I can use. | Boy | | 6.43 | |
| | Girl | | 6.41 | |
| I would tell my friends to come to DoD STARBASE. | Boy | | 6.23 | |
| | Girl | | 6.21 | |

**Appendix C:**
**Gender Gap Score Differences 2015 Post-Program Attitudes**

| | Girls' Rank by Mean | Girls' Mean | Boys' Rank by Mean | Boys' Mean | Gap |
|---|---|---|---|---|---|
| DoD STARBASE is boring. (Reversed Scored) | 1 | 6.47 | 1 | 6.57 | 0.10 |
| I have enjoyed coming to a military base. | 2 | 6.45 | 2 | 6.53 | 0.08 |
| At DoD STARBASE, I learned a lot of things that I can use | 3 | 6.41 | 4 | 6.43 | 0.02 |
| DoD STARBASE Instructors made learning about STEM topics fun. | 4/5 | 6.37 | 5 | 6.38 | 0.02 |
| I do not think DoD STARBASE will help me do better in school. (Reversed Scored) | 4/5 | 6.37 | 3 | 6.48 | 0.11 |
| I would tell my friends to come to DoD STARBASE. | 6 | 6.21 | 9 | 6.23 | 0.02 |
| People who work on a military base do lots of different things. | 7 | 6.16 | 8 | 6.25 | 0.08 |
| **I like figuring out how to use technology gear (tablets,smart phones,etc.).** | **8** | **6.11** | **6** | **6.36** | **0.25** |
| Scientists work on things that will make life better. | 9 | 6.05 | 12 | 6.10 | 0.05 |
| People who work for the military use technology in their jobs. | 10 | 5.97 | 7 | 6.30 | 0.32 |
| Most people use STEM skills every day. | 11 | 5.95 | 14 | 5.92 | -0.03 |
| **I like technology.** | **12** | **5.90** | **10** | **6.17** | **0.27** |
| I think learning about STEM topics will help me in my daily life. | 13/14 | 5.82 | 16 | 5.82 | 0.00 |
| **Military bases are exciting.** | **13/14** | **5.82** | **11** | **6.14** | **0.32** |
| **Engineers help solve challenging problems.** | **15** | **5.71** | **15** | **5.91** | **0.20** |
| I need to do well in math to get the kind of job I want. | 16 | 5.69 | 17 | 5.67 | -0.02 |
| I am aware of some STEM careers. | 17 | 5.64 | 23/24 | 5.51 | -0.13 |
| **I want to learn more about technology.** | **18** | **5.61** | **13** | **6.00** | **0.38** |
| I like science. | 19 | 5.60 | 21/22 | 5.53 | -0.08 |
| I enjoy learning about STEM topics. | 20/21 | 5.42 | 25 | 5.48 | 0.06 |
| I am good at science. | 20/21 | 5.42 | 26 | 5.47 | 0.05 |
| STEM jobs are exciting. | 22 | 5.38 | 27 | 5.43 | 0.05 |
| **I am good at math.** | **23** | **5.35** | **19** | **5.60** | **0.24** |
| **A military base is a good place to work.** | **24** | **5.33** | **23/24** | **5.51** | **0.18** |
| Learning about science is easy for me. | 25 | 5.11 | 31 | 5.18 | 0.07 |
| I like math. | 26/27 | 5.10 | 30 | 5.21 | 0.11 |
| **I like engineering.** | **26/27** | **5.10** | **18** | **5.66** | **0.57** |
| **I would take classes on technology if available.** | **28** | **5.07** | **20** | **5.56** | **0.49** |
| **When I finish school, I would like to get a job where I could use STEM.** | **29** | **5.06** | **29** | **5.28** | **0.22** |
| **I want to learn more about engineering.** | **30** | **5.01** | **21/22** | **5.53** | **0.52** |
| I would like to take more science classes. | 31 | 4.98 | 32 | 4.86 | -0.12 |
| I would like to take more math classes. | 32 | 4.71 | 34 | 4.59 | -0.12 |
| **I would take engineering classes if offered.** | **33** | **4.60** | **28** | **5.30** | **0.70** |
| I would like a job in a science-related area. | 34 | 4.45 | 35 | 4.58 | 0.13 |
| **I am interested in being a scientist or engineer.** | **35** | **4.16** | **33** | **4.82** | **0.66** |
| I would like to join a science club at my school. | 36 | 4.09 | 36 | 4.01 | -0.08 |

*Bold items show significant differences based on gender*

**Appendix D:**
**Intercorrelations Among Student Characteristics and Expressed STEM Attitude**

**Pearson Correlation Matrix**

| | Grade | Age | Gender | I am good at science. | Learning about science is easy for me. | I would like to join a science club at my school. |
|---|---|---|---|---|---|---|
| Grade | 1.000 | | | | | |
| Age | 0.379 | 1.000 | | | | |
| Gender | 0.003 | -0.084 | 1.000 | | | |
| I am good at science. | 0.040 | 0.026 | -0.018 | 1.000 | | |
| Learning about science is easy for me. | 0.081 | 0.058 | -0.022 | 0.717 | 1.000 | |
| I would like to join a science club at my school. | 0.010 | 0.014 | 0.020 | 0.420 | 0.469 | 1.000 |
| I am interested in being a scientist or engineer. | 0.050 | 0.031 | -0.165 | 0.327 | 0.364 | 0.453 |
| Military bases are exciting. | -0.057 | 0.020 | -0.114 | 0.149 | 0.146 | 0.151 |
| I am good at math. | -0.043 | -0.010 | -0.073 | 0.272 | 0.257 | 0.134 |
| I want to learn more about technology. | -0.031 | -0.020 | -0.127 | 0.247 | 0.316 | 0.323 |
| I like technology. | -0.012 | -0.011 | -0.095 | 0.203 | 0.260 | 0.253 |
| I would like a job in a science- related area. | 0.048 | 0.020 | -0.034 | 0.431 | 0.475 | 0.555 |
| STEM jobs are exciting. | 0.089 | 0.007 | -0.015 | 0.331 | 0.406 | 0.414 |
| Engineers help solve challenging problems. | 0.086 | 0.038 | -0.071 | 0.273 | 0.329 | 0.211 |
| A military base is a good place to work. | 0.018 | 0.050 | -0.060 | 0.145 | 0.177 | 0.185 |
| I like science. | -0.017 | 0.010 | 0.023 | 0.560 | 0.592 | 0.541 |
| I would take engineering classes if offered. | 0.056 | 0.029 | -0.189 | 0.324 | 0.375 | 0.446 |
| I would take classes on technology if available. | -0.003 | -0.030 | -0.137 | 0.235 | 0.313 | 0.361 |
| I am aware of some STEM careers. | 0.161 | 0.069 | 0.041 | 0.322 | 0.329 | 0.268 |
| I would like to take more math classes. | -0.054 | -0.021 | 0.028 | 0.138 | 0.177 | 0.266 |
| I like engineering. | 0.095 | 0.047 | -0.165 | 0.300 | 0.345 | 0.313 |
| Most people use STEM skills every day. | 0.113 | 0.063 | 0.012 | 0.240 | 0.259 | 0.201 |
| I want to learn more about engineering. | 0.056 | 0.034 | -0.148 | 0.320 | 0.376 | 0.339 |
| I like math. | -0.091 | -0.047 | -0.027 | 0.131 | 0.146 | 0.181 |
| I would like to take more science classes. | 0.002 | 0.016 | 0.030 | 0.461 | 0.494 | 0.614 |
| I enjoy learning about STEM topics. | 0.058 | 0.020 | -0.018 | 0.338 | 0.398 | 0.447 |
| People who work on a military base do lots of different things. | 0.004 | -0.001 | -0.036 | 0.131 | 0.162 | 0.103 |
| When I finish school, I would like to get a job where I could use STEM. | 0.068 | 0.017 | -0.062 | 0.300 | 0.364 | 0.388 |

**Appendix D: (Continued)**
**Intercorrelations Among Student Characteristics and Expressed STEM Attitude**

**Pearson Correlation Matrix**

| | Grade | Age | Gender | I am good at science. | Learning about science is easy for me. | I would like to join a science club at my school. |
|---|---|---|---|---|---|---|
| I think learning about STEM topics will help me in my daily life. | 0.054 | -0.004 | 0.000 | 0.316 | 0.335 | 0.304 |
| I like figuring out how to use technology gear (tablets,smart phones,etc.). | -0.006 | -0.030 | -0.093 | 0.137 | 0.175 | 0.196 |
| I do not think DoD STARBASE will help me do better in school. (Reversed Scored) | 0.016 | -0.035 | -0.039 | 0.102 | 0.093 | 0.068 |
| Scientists work on things that will make life better. | -0.006 | 0.002 | -0.020 | 0.304 | 0.275 | 0.206 |
| I need to do well in math to get the kind of job I want. | -0.039 | -0.020 | 0.008 | 0.155 | 0.181 | 0.209 |
| People who work for the military use technology in their jobs. | -0.031 | -0.020 | -0.132 | 0.217 | 0.197 | 0.143 |
| I have enjoyed coming to a military base. | -0.014 | -0.004 | -0.040 | 0.133 | 0.163 | 0.160 |
| DoD STARBASE Instructors made learning about STEM topics fun. | 0.054 | 0.033 | -0.007 | 0.233 | 0.279 | 0.255 |
| DoD STARBASE is boring. (Reversed Scored) | 0.021 | 0.033 | -0.041 | 0.122 | 0.137 | 0.158 |
| At DoD STARBASE, I learned a lot of things that I can use. | -0.054 | -0.048 | -0.010 | 0.279 | 0.310 | 0.256 |
| I would tell my friends to come to DoD STARBASE. | -0.016 | 0.019 | -0.007 | 0.140 | 0.199 | 0.264 |

**Pearson Correlation Matrix (Continued)**

| | I am interested in being a scientist or engineer. | Military bases are exciting. | I am good at math. | I want to learn more about technology. | I like technology. |
|---|---|---|---|---|---|
| Grade | | | | | |
| Age | | | | | |
| Gender | | | | | |
| I am good at science. | | | | | |
| Learning about science is easy for me. | | | | | |
| I would like to join a science club at my school. | | | | | |
| I am interested in being a scientist or engineer. | 1.000 | | | | |
| Military bases are exciting. | 0.181 | 1.000 | | | |
| I am good at math. | 0.163 | 0.154 | 1.000 | | |
| I want to learn more about technology. | 0.393 | 0.211 | 0.200 | 1.000 | |
| I like technology. | 0.298 | 0.203 | 0.136 | 0.669 | 1.000 |
| I would like a job in a science-related area. | 0.622 | 0.207 | 0.161 | 0.383 | 0.303 |
| STEM jobs are exciting. | 0.482 | 0.275 | 0.213 | 0.389 | 0.294 |

*Continued on next page*

**Pearson Correlation Matrix (Continued)**

| | I am interested in being a scientist or engineer. | Military bases are exciting. | I am good at math. | I want to learn more about technology. | I like technology. |
|---|---|---|---|---|---|
| Engineers help solve challenging problems. | 0.307 | 0.247 | 0.199 | 0.274 | 0.264 |
| A military base is a good place to work. | 0.237 | 0.494 | 0.151 | 0.247 | 0.205 |
| I like science. | 0.377 | 0.180 | 0.118 | 0.333 | 0.235 |
| I would take engineering classes if offered. | 0.632 | 0.225 | 0.184 | 0.461 | 0.351 |
| I would take classes on technology if available. | 0.463 | 0.208 | 0.160 | 0.645 | 0.572 |
| I am aware of some STEM careers. | 0.337 | 0.154 | 0.187 | 0.232 | 0.222 |
| I would like to take more math classes. | 0.180 | 0.157 | 0.436 | 0.220 | 0.101 |
| I like engineering. | 0.576 | 0.225 | 0.152 | 0.415 | 0.383 |
| Most people use STEM skills every day. | 0.237 | 0.204 | 0.131 | 0.221 | 0.211 |
| I want to learn more about engineering. | 0.558 | 0.240 | 0.181 | 0.446 | 0.388 |
| I like math. | 0.146 | 0.170 | 0.650 | 0.195 | 0.110 |
| I would like to take more science classes. | 0.453 | 0.183 | 0.119 | 0.354 | 0.261 |
| I enjoy learning about STEM topics. | 0.459 | 0.267 | 0.141 | 0.373 | 0.276 |
| People who work on a military base do lots of different things. | 0.113 | 0.371 | 0.103 | 0.204 | 0.230 |
| When I finish school, I would like to get a job where I could use STEM. | 0.516 | 0.199 | 0.166 | 0.363 | 0.284 |
| I think learning about STEM topics will help me in my daily life. | 0.354 | 0.254 | 0.207 | 0.325 | 0.285 |
| I like figuring out how to use technology gear (tablets,smart phones,etc.). | 0.220 | 0.185 | 0.119 | 0.421 | 0.460 |
| I do not think DoD STARBASE will help me do better in school. (Reversed Scored) | 0.062 | 0.089 | 0.041 | 0.099 | 0.106 |
| Scientists work on things that will make life better. | 0.208 | 0.232 | 0.163 | 0.230 | 0.261 |
| I need to do well in math to get the kind of job I want. | 0.195 | 0.168 | 0.217 | 0.251 | 0.172 |
| People who work for the military use technology in their jobs. | 0.235 | 0.351 | 0.100 | 0.247 | 0.255 |
| I have enjoyed coming to a military base. | 0.179 | 0.509 | 0.143 | 0.221 | 0.187 |
| DoD STARBASE Instructors made learning about STEM topics fun. | 0.244 | 0.246 | 0.141 | 0.284 | 0.182 |
| DoD STARBASE is boring. (Reversed Scored) | 0.189 | 0.236 | 0.070 | 0.216 | 0.145 |
| At DoD STARBASE, I learned a lot of things that I can use. | 0.259 | 0.267 | 0.143 | 0.321 | 0.232 |
| I would tell my friends to come to DoD STARBASE. | 0.218 | 0.273 | 0.143 | 0.284 | 0.201 |

**Pearson Correlation Matrix (Continued)**

| | I would like a job in a science-related area. | STEM jobs are exciting. | Engineers help solve challenging problems. | A military base is a good place to work. |
|---|---|---|---|---|
| Grade | | | | |
| Age | | | | |
| Gender | | | | |
| I am good at science. | | | | |
| Learning about science is easy for me. | | | | |
| I would like to join a science club at my school. | | | | |
| I am interested in being a scientist or engineer. | | | | |
| Military bases are exciting. | | | | |
| I am good at math. | | | | |
| I want to learn more about technology. | | | | |
| I like technology. | | | | |
| I would like a job in a science- related area. | 1.000 | | | |
| STEM jobs are exciting. | 0.550 | 1.000 | | |
| Engineers help solve challenging problems. | 0.308 | 0.416 | 1.000 | |
| A military base is a good place to work. | 0.268 | 0.309 | 0.270 | 1.000 |
| I like science. | 0.543 | 0.403 | 0.303 | 0.188 |
| I would take engineering classes if offered. | 0.523 | 0.482 | 0.369 | 0.294 |
| I would take classes on technology if available. | 0.418 | 0.390 | 0.306 | 0.257 |
| I am aware of some STEM careers. | 0.413 | 0.457 | 0.360 | 0.174 |
| I would like to take more math classes. | 0.182 | 0.255 | 0.136 | 0.193 |
| I like engineering. | 0.453 | 0.457 | 0.418 | 0.260 |
| Most people use STEM skills every day. | 0.291 | 0.398 | 0.345 | 0.243 |
| I want to learn more about engineering. | 0.468 | 0.472 | 0.421 | 0.305 |
| I like math. | 0.140 | 0.191 | 0.151 | 0.155 |
| I would like to take more science classes. | 0.582 | 0.434 | 0.275 | 0.237 |
| I enjoy learning about STEM topics. | 0.520 | 0.632 | 0.344 | 0.304 |
| People who work on a military base do lots of different things. | 0.188 | 0.226 | 0.327 | 0.421 |
| When I finish school, I would like to get a job where I could use STEM. | 0.579 | 0.585 | 0.359 | 0.293 |
| I think learning about STEM topics will help me in my daily life. | 0.403 | 0.543 | 0.396 | 0.306 |
| I like figuring out how to use technology gear (tablets,smart phones,etc.). | 0.193 | 0.231 | 0.250 | 0.185 |

*Continued on next page*

**Pearson Correlation Matrix (Continued)**

| | I would like a job in a science-related area. | STEM jobs are exciting. | Engineers help solve challenging problems. | A military base is a good place to work. |
|---|---|---|---|---|
| I do not think DoD STARBASE will help me do better in school. (Reversed Scored) | 0.078 | 0.139 | 0.126 | 0.041 |
| Scientists work on things that will make life better. | 0.258 | 0.287 | 0.374 | 0.196 |
| I need to do well in math to get the kind of job I want. | 0.211 | 0.204 | 0.209 | 0.202 |
| People who work for the military use technology in their jobs. | 0.277 | 0.248 | 0.305 | 0.374 |
| I have enjoyed coming to a military base. | 0.180 | 0.223 | 0.178 | 0.334 |
| DoD STARBASE Instructors made learning about STEM topics fun. | 0.277 | 0.410 | 0.216 | 0.206 |
| DoD STARBASE is boring. (Reversed Scored) | 0.180 | 0.247 | 0.113 | 0.148 |
| At DoD STARBASE, I learned a lot of things that I can use. | 0.287 | 0.356 | 0.312 | 0.241 |
| I would tell my friends to come to DoD STARBASE. | 0.224 | 0.304 | 0.162 | 0.255 |

**Pearson Correlation Matrix (Continued)**

| | I like science. | I would take engineering classes if offered. | I would take classes on technology if available. | I am aware of STEM careers. | I would like to take more math classes. |
|---|---|---|---|---|---|
| Grade | | | | | |
| Age | | | | | |
| Gender | | | | | |
| I am good at science. | | | | | |
| Learning about science is easy for me. | | | | | |
| I would like to join a science club at my school. | | | | | |
| I am interested in being a scientist or engineer. | | | | | |
| Military bases are exciting. | | | | | |
| I am good at math. | | | | | |
| I want to learn more about technology. | | | | | |
| I like technology. | | | | | |
| I would like a job in a science- related area. | | | | | |
| STEM jobs are exciting. | | | | | |
| Engineers help solve challenging problems. | | | | | |
| A military base is a good place to work. | | | | | |
| I like science. | 1.000 | | | | |
| I would take engineering classes if offered. | 0.406 | 1.000 | | | |
| I would take classes on technology if available. | 0.274 | 0.623 | 1.000 | | |

**Pearson Correlation Matrix (Continued)**

| | I like science. | I would take engineering classes if offered. | I would take classes on technology if available. | I am aware of STEM careers, | I would like to take more math classes. |
|---|---|---|---|---|---|
| I am aware of some STEM careers. | 0.276 | 0.345 | 0.315 | 1.000 | |
| I would like to take more math classes. | 0.165 | 0.249 | 0.236 | 0.116 | 1.000 |
| I like engineering. | 0.339 | 0.661 | 0.497 | 0.333 | 0.216 |
| Most people use STEM skills every day. | 0.244 | 0.292 | 0.258 | 0.407 | 0.141 |
| I want to learn more about engineering. | 0.388 | 0.689 | 0.530 | 0.331 | 0.237 |
| I like math. | 0.158 | 0.169 | 0.175 | 0.094 | 0.695 |
| I would like to take more science classes. | 0.694 | 0.487 | 0.386 | 0.312 | 0.290 |
| I enjoy learning about STEM topics. | 0.443 | 0.502 | 0.409 | 0.406 | 0.287 |
| People who work on a military base do lots of different things. | 0.148 | 0.171 | 0.222 | 0.230 | 0.115 |
| When I finish school, I would like to get a job where I could use STEM. | 0.339 | 0.513 | 0.433 | 0.464 | 0.197 |
| I think learning about STEM topics will help me in my daily life. | 0.335 | 0.437 | 0.369 | 0.455 | 0.192 |
| I like figuring out how to use technology gear (tablets,smart phones,etc.). | 0.166 | 0.286 | 0.399 | 0.204 | 0.146 |
| I do not think DoD STARBASE will help me do better in school. (Reversed Scored) | 0.124 | 0.103 | 0.081 | 0.122 | 0.003 |
| Scientists work on things that will make life better. | 0.272 | 0.252 | 0.234 | 0.276 | 0.094 |
| I need to do well in math to get the kind of job I want. | 0.223 | 0.246 | 0.212 | 0.133 | 0.336 |
| People who work for the military use technology in their jobs. | 0.193 | 0.232 | 0.258 | 0.262 | 0.147 |
| I have enjoyed coming to a military base. | 0.195 | 0.236 | 0.189 | 0.170 | 0.145 |
| DoD STARBASE Instructors made learning about STEM topics fun. | 0.289 | 0.279 | 0.243 | 0.269 | 0.144 |
| DoD STARBASE is boring. (Reversed Scored) | 0.208 | 0.192 | 0.159 | 0.105 | 0.078 |
| At DoD STARBASE, I learned a lot of things that I can use. | 0.329 | 0.307 | 0.269 | 0.259 | 0.155 |
| I would tell my friends to come to DoD STARBASE. | 0.250 | 0.276 | 0.257 | 0.161 | 0.169 |

**Pearson Correlation Matrix (Continued)**

| | I like engineering. | Most people use STEM skills every day. | I want to learn more about engineering. | I like math. | I would like to take more science classes. |
|---|---|---|---|---|---|
| Grade | | | | | |
| Age | | | | | |
| Gender | | | | | |
| I am good at science. | | | | | |
| Learning about science is easy for me. | | | | | |
| I would like to join a science club at my school. | | | | | |
| I am interested in being a scientist or engineer. | | | | | |
| Military bases are exciting. | | | | | |
| I am good at math. | | | | | |
| I want to learn more about technology. | | | | | |
| I like technology. | | | | | |
| I would like a job in a science- related area. | | | | | |
| STEM jobs are exciting. | | | | | |
| Engineers help solve challenging problems. | | | | | |
| A military base is a good place to work. | | | | | |
| I like science. | | | | | |
| I would take engineering classes if offered. | | | | | |
| I would take classes on technology if available. | | | | | |
| I am aware of some STEM careers. | | | | | |
| I would like to take more math classes. | | | | | |
| I like engineering. | 1.000 | | | | |
| Most people use STEM skills every day. | 0.307 | 1.000 | | | |
| I want to learn more about engineering. | 0.743 | 0.329 | 1.000 | | |
| I like math. | 0.147 | 0.109 | 0.217 | 1.000 | |
| I would like to take more science classes. | 0.363 | 0.256 | 0.414 | 0.183 | 1.000 |
| I enjoy learning about STEM topics. | 0.439 | 0.411 | 0.515 | 0.217 | 0.572 |
| People who work on a military base do lots of different things. | 0.167 | 0.321 | 0.245 | 0.117 | 0.157 |
| When I finish school, I would like to get a job where I could use STEM. | 0.437 | 0.362 | 0.476 | 0.167 | 0.426 |
| I think learning about STEM topics will help me in my daily life. | 0.373 | 0.459 | 0.429 | 0.170 | 0.370 |
| I like figuring out how to use technology gear (tablets,smart phones,etc.). | 0.239 | 0.229 | 0.295 | 0.115 | 0.225 |

| | I like engineering. | Most people use STEM skills every day. | I want to learn more about engineering. | I like math. | I would like to take more science classes. |
|---|---|---|---|---|---|
| I do not think DoD STARBASE will help me do better in school. (Reversed Scored) | 0.092 | 0.090 | 0.087 | 0.005 | 0.093 |
| Scientists work on things that will make life better. | 0.247 | 0.321 | 0.280 | 0.064 | 0.258 |
| I need to do well in math to get the kind of job I want. | 0.213 | 0.189 | 0.239 | 0.271 | 0.253 |
| People who work for the military use technology in their jobs. | 0.283 | 0.347 | 0.288 | 0.105 | 0.183 |
| I have enjoyed coming to a military base. | 0.195 | 0.217 | 0.222 | 0.144 | 0.195 |
| DoD STARBASE Instructors made learning about STEM topics fun. | 0.233 | 0.279 | 0.283 | 0.133 | 0.313 |
| DoD STARBASE is boring. (Reversed Scored) | 0.142 | 0.153 | 0.184 | 0.095 | 0.197 |
| At DoD STARBASE, I learned a lot of things that I can use. | 0.263 | 0.253 | 0.340 | 0.168 | 0.304 |
| I would tell my friends to come to DoD STARBASE. | 0.220 | 0.205 | 0.297 | 0.193 | 0.266 |

**Pearson Correlation Matrix (Continued)**

| | I enjoy learning about STEM topics. | People who work on a military base do lots of different things. | When I finish school, I would like to get a job where I could use STEM. | I think learning about STEM topics will help me in my daily life. |
|---|---|---|---|---|
| Grade | | | | |
| Age | | | | |
| Gender | | | | |
| I am good at science. | | | | |
| Learning about science is easy for me. | | | | |
| I would like to join a science club at my school. | | | | |
| I am interested in being a scientist or engineer. | | | | |
| Military bases are exciting. | | | | |
| I am good at math. | | | | |
| I want to learn more about technology. | | | | |
| I like technology. | | | | |
| I would like a job in a science- related area. | | | | |
| STEM jobs are exciting. | | | | |
| Engineers help solve challenging problems. | | | | |
| A military base is a good place to work. | | | | |

**Pearson Correlation Matrix (Continued)**

| | I enjoy learning about STEM topics. | People who work on a military base do lots of different things. | When I finish school, I would like to get a job where I could use STEM. | I think learning about STEM topics will help me in my daily life. |
|---|---|---|---|---|
| I like science. | | | | |
| I would take engineering classes if offered. | | | | |
| I would take classes on technology if available. | | | | |
| I am aware of some STEM careers. | | | | |
| I would like to take more math classes. | | | | |
| I like engineering. | | | | |
| Most people use STEM skills every day. | | | | |
| I want to learn more about engineering. | | | | |
| I like math. | | | | |
| I would like to take more science classes. | | | | |
| I enjoy learning about STEM topics. | 1.000 | | | |
| People who work on a military base do lots of different things. | 0.249 | 1.000 | | |
| When I finish school, I would like to get a job where I could use STEM. | 0.593 | 0.214 | 1.000 | |
| I think learning about STEM topics will help me in my daily life. | 0.527 | 0.291 | 0.582 | 1.000 |
| I like figuring out how to use technology gear (tablets,smart phones,etc.). | 0.250 | 0.217 | 0.225 | 0.272 |
| I do not think DoD STARBASE will help me do better in school. (Reversed Scored) | 0.119 | 0.086 | 0.098 | 0.171 |
| Scientists work on things that will make life better. | 0.303 | 0.310 | 0.266 | 0.391 |
| I need to do well in math to get the kind of job I want. | 0.238 | 0.186 | 0.258 | 0.237 |
| People who work for the military use technology in their jobs. | 0.279 | 0.490 | 0.318 | 0.368 |
| I have enjoyed coming to a military base. | 0.271 | 0.282 | 0.165 | 0.244 |
| DoD STARBASE Instructors made learning about STEM topics fun. | 0.412 | 0.146 | 0.321 | 0.349 |
| DoD STARBASE is boring. (Reversed Scored) | 0.224 | 0.139 | 0.194 | 0.194 |
| At DoD STARBASE, I learned a lot of things that I can use. | 0.329 | 0.251 | 0.302 | 0.391 |
| I would tell my friends to come to DoD STARBASE. | 0.336 | 0.198 | 0.225 | 0.242 |

**Pearson Correlation Matrix (Continued)**

| | I like figuring out how to use technology gear... | I do not think DoD STARBASE will help me do... | Scientists work on things that will make life better. | I need to do well in math to get the kind of job I want. |
|---|---|---|---|---|
| Grade | | | | |
| Age | | | | |
| Gender | | | | |
| I am good at science. | | | | |
| Learning about science is easy for me. | | | | |
| I would like to join a science club at my school. | | | | |
| I am interested in being a scientist or engineer. | | | | |
| Military bases are exciting. | | | | |
| I am good at math. | | | | |
| I want to learn more about technology. | | | | |
| I like technology. | | | | |
| I would like a job in a science- related area. | | | | |
| STEM jobs are exciting. | | | | |
| Engineers help solve challenging problems. | | | | |
| A military base is a good place to work. | | | | |
| I like science. | | | | |
| I would take engineering classes if offered. | | | | |
| I would take classes on technology if available. | | | | |
| I am aware of some STEM careers. | | | | |
| I would like to take more math classes. | | | | |
| I like engineering. | | | | |
| Most people use STEM skills every day. | | | | |
| I want to learn more about engineering. | | | | |
| I like math. | | | | |
| I would like to take more science classes. | | | | |
| I enjoy learning about STEM topics. | | | | |
| People who work on a military base do lots of different things. | | | | |
| When I finish school, I would like to get a job where I could use STEM. | | | | |
| I think learning about STEM topics will help me in my daily life. | | | | |
| I like figuring out how to use technology gear (tablets,smart phones,etc.). | 1.000 | | | |
| I do not think DoD STARBASE will help me do better in school. (Reversed Scored) | 0.154 | 1.000 | | |

**Pearson Correlation Matrix (Continued)**

| | I like figuring out how to use technology gear... | I do not think DoD STARBASE will help me do... | Scientists work on things that will make life better. | I need to do well in math to get the kind of job I want. |
|---|---|---|---|---|
| Scientists work on things that will make life better. | 0.303 | 0.168 | 1.000 | |
| I need to do well in math to get the kind of job I want. | 0.185 | 0.032 | 0.212 | 1.000 |
| People who work for the military use technology in their jobs. | 0.264 | 0.043 | 0.300 | 0.238 |
| I have enjoyed coming to a military base. | 0.141 | 0.148 | 0.166 | 0.152 |
| DoD STARBASE Instructors made learning about STEM topics fun. | 0.163 | 0.244 | 0.258 | 0.171 |
| DoD STARBASE is boring. (Reversed Scored) | 0.127 | 0.334 | 0.154 | 0.096 |
| At DoD STARBASE, I learned a lot of things that I can use. | 0.239 | 0.244 | 0.315 | 0.231 |
| I would tell my friends to come to DoD STARBASE. | 0.174 | 0.216 | 0.159 | 0.162 |

**Pearson Correlation Matrix (Continued)**

| | People who work for the military use technology. | I have enjoyed coming to a military base. | DoD STARBASE made learning about... | DoD STARBASE is boring. (Reversed Scored) | At DoD STARBASE learned a lot of things that I can use. |
|---|---|---|---|---|---|
| Grade | | | | | |
| Age | | | | | |
| Gender | | | | | |
| I am good at science. | | | | | |
| Learning about science is easy for me. | | | | | |
| I would like to join a science club at my school. | | | | | |
| I am interested in being a scientist or engineer. | | | | | |
| Military bases are exciting. | | | | | |
| I am good at math. | | | | | |
| I want to learn more about technology. | | | | | |
| I like technology. | | | | | |
| I would like a job in a science- related area. | | | | | |
| STEM jobs are exciting. | | | | | |
| Engineers help solve challenging problems. | | | | | |
| A military base is a good place to work. | | | | | |
| I like science. | | | | | |
| I would take engineering classes if offered. | | | | | |
| I would take classes on technology if available. | | | | | |
| I am aware of some STEM careers. | | | | | |

**Pearson Correlation Matrix (Continued)**

| | People who work for the military use technology. | I have enjoyed coming to a military base. | DoD STARBASE made learning about... | DoD STARBASE is boring. (Reversed Scored) | At DoD STARBASE learned a lot of things that I can use. |
|---|---|---|---|---|---|
| I would like to take more math classes. | | | | | |
| I like engineering. | | | | | |
| Most people use STEM skills every day. | | | | | |
| I want to learn more about engineering. | | | | | |
| I like math. | | | | | |
| I would like to take more science classes. | | | | | |
| I enjoy learning about STEM topics. | | | | | |
| People who work on a military base do lots of different things. | | | | | |
| When I finish school, I would like to get a job where I could use STEM. | | | | | |
| I think learning about STEM topics will help me in my daily life. | | | | | |
| I like figuring out how to use technology gear (tablets,smart phones,etc.). | | | | | |
| I do not think DoD STARBASE will help me do better in school. (Reversed Scored) | | | | | |
| Scientists work on things that will make life better. | | | | | |
| I need to do well in math to get the kind of job I want. | | | | | |
| People who work for the military use technology in their jobs. | 1.000 | | | | |
| I have enjoyed coming to a military base. | 0.265 | 1.000 | | | |
| DoD STARBASE Instructors made learning about STEM topics fun. | 0.177 | 0.451 | 1.000 | | |
| DoD STARBASE is boring. (Reversed Scored) | 0.121 | 0.360 | 0.493 | 1.000 | |
| At DoD STARBASE, I learned a lot of things that I can use. | 0.257 | 0.386 | 0.537 | 0.382 | 1.000 |
| I would tell my friends to come to DoD STARBASE. | 0.170 | 0.399 | 0.541 | 0.511 | 0.514 |

**Appendix E:**
**Attitudinal Items by Measurement Area and PCA Analysis of Attitude Dimensions**

ATTITUDINAL ITEMS BY MEASUREMENT AREA 2014 – 2015

| # | Attitudinal Survey Dimension/Item |
|---|---|
| | STEM Concept Awareness |
| 7 | I want to learn more about technology. |
| 8 | I like technology. |
| 15 | I would take classes on technology if available. |
| 27 | I like figuring out how to use technology gear (tablets, smart phones, etc.). |
| | Science Confidence |
| 1 | I am good at science. |
| 2 | Learning about science is easy for me. |
| 3 | I would like to join a science club at my school. |
| 13 | I like science. |
| 22 | I would like to take more science classes. |
| | Math Confidence |
| 6 | I am good at math. |
| 17 | I would like to take more math classes. |
| 21 | I like math. |
| 30 | I need to do well in math to get the kind of job I want. |
| | STEM Behavior & Motivation |
| 11 | Engineers help solve challenging problems. |
| 16 | I am aware of some STEM careers. |
| 19 | Most people use STEM skills every day. |
| 26 | I think learning about STEM topics will help me in my daily life. |
| 29 | Scientists work on things that will make life better. |
| | Future Planning |
| 4 | I am interested in being a scientist or engineer. |
| 9 | I would like a job in a science-related area. |
| 10 | STEM jobs are exciting. |
| 14 | I would take engineering classes if offered. |
| 18 | I like engineering. |
| 20 | I want to learn more about engineering. |
| 23 | I enjoy learning about STEM topics. |
| 25 | When I finish school, I would like to get a job where I could use STEM. |
| | Military Settings Endorsement |
| 5 | Military bases are exciting. |
| 12 | A military base is a good place to work. |
| 24 | People who work on a military base do lots of different things. |
| 31 | People who work for the military use technology in their jobs. |
| 32 | I have enjoyed coming to a military base. |
| | DoD STARBASE Program Evaluation |
| 28 | I do not think DoD STARBASE will help me do better in school. (Reversed Scored) |
| 33 | DoD STARBASE Instructors made learning about STEM topics fun. |
| 34 | DoD STARBASE is boring. (Reversed Scored) |
| 35 | At DoD STARBASE, I learned a lot of things that I can use. |
| 36 | I would tell my friends to come to DoD STARBASE. |

Items were assigned to Attitude Dimensions based on their highest loadings on the seven factors shown below. Factors are listed in order of contribution to the results.

ROTATED COMPONENT MATRIX

| | Component | | | | | | |
|---|---|---|---|---|---|---|---|
| | Future Planning | Science Confidence | Program Evaluation | STEM Behavior & Motivation | Military Settings Endorse | STEM Concept Awareness | Math Confidence |
| I would take engineering classes if offered. | .736 | | | | | | |
| I am interested in being a scientist or engineer. | .723 | | | | | | |
| I like engineering. | .692 | | | | | | |
| I want to learn more about engineering. | .675 | | | | | | |
| When I finish school, I would like to get a job where I could use STEM. | .628 | | | .421 | | | |
| I would like a job in a science-related area. | .586 | .500 | | | | | |
| I enjoy learning about STEM topics. | .570 | | | | | | |
| STEM jobs are exciting. | .565 | | | .408 | | | |
| I like science. | | .781 | | | | | |
| I am good at science. | | .768 | | | | | |
| Learning about science is easy for me. | | .754 | | | | | |
| I would like to take more science classes. | .413 | .670 | | | | | |
| I would like to join a science club at my school. | .397 | .629 | | | | | |
| DoD STARBASE is boring. (Reversed Scored) | | | .761 | | | | |
| DoD STARBASE Instructors made learning about STEM topics fun. | | | .738 | | | | |
| I would tell my friends to come to DoD STARBASE. | | | .724 | | | | |
| At DoD STARBASE, I learned a lot of things that I can use | | | .610 | | | | |
| I do not think DoD STARBASE will help me do better in school. (Reversed Scored) | | | .516 | | | | |
| Most people use STEM skills every day. | | | | .609 | | | |
| I think learning about STEM topics will help me in my daily life. | .380 | | | .605 | | | |

ROTATED COMPONENT MATRIX (Continued)

| | Component | | | | | | |
|---|---|---|---|---|---|---|---|
| | Future Planning | Science Confidence | Program Evaluation | STEM Behavior & Motivation | Military Settings Endorse | STEM Concept Awareness | Math Confidence |
| I am aware of some STEM careers. | .342 | | | .602 | | | |
| Scientists work on things that will make life better. | | | | .554 | | | |
| Engineers help solve challenging problems. | | | | .527 | | | |
| Military bases are exciting. | | | | | .731 | | |
| A military base is a good place to work. | | | | | .708 | | |
| People who work on a military base do lots of different things. | | | | .365 | .648 | | |
| People who work for the military use technology in their jobs. | | | | .383 | .586 | | |
| I have enjoyed coming to a military base. | | | .514 | | .538 | | |
| I like technology. | | | | | | .784 | |
| I want to learn more about technology. | .358 | | | | | .697 | |
| I like figuring out how to use technology gear (tablets,smart phones,etc.). | | | | | | .665 | |
| I would take classes on technology if available. | .535 | | | | | .602 | |
| I like math. | | | | | | | .901 |
| I would like to take more math classes. | | | | | | | .806 |
| I am good at math. | | | | | | | .775 |
| I need to do well in math to get the kind of job I want. | | | | | | | .391 |

*In the interest of simplicity, loadings below .34 are not shown.*

**Appendix F:**
**Intercorrelations Among Student Characteristics and Attitude Dimensions**

**Pearson Correlation Matrix**

| | Grade | Grade | Age | I heard about DoD STARBASE before I knew I I was... | I know someone that went through DoD STARBASE before... | I have met military people before coming to DoD STARBASE. |
|---|---|---|---|---|---|---|
| Gender | 1.000 | | | | | |
| Grade | 0.003 | 1.000 | | | | |
| Age | -0.084 | 0.379 | 1.000 | | | |
| I heard about DoD STARBASE before I knew I was coming here. | -0.019 | -0.025 | 0.015 | 1.000 | | |
| I know someone that went through DoD STARBASE before me. | -0.025 | 0.015 | -0.011 | 0.408 | 1.000 | |
| I have met military people before coming to DoD STARBASE. | -0.079 | 0.083 | 0.049 | 0.070 | 0.093 | 1.000 |
| High Military Attitude | -0.086 | 0.008 | 0.009 | 0.076 | 0.059 | 0.105 |
| Total Knowledge (post) | -0.004 | 0.217 | 0.008 | 0.045 | 0.102 | 0.147 |
| STEM Concept Awareness (post) | -0.128 | -0.016 | -0.027 | 0.045 | 0.015 | 0.024 |
| Future Planning (post) | -0.129 | 0.081 | 0.034 | 0.051 | 0.073 | 0.119 |
| Science Confidence (post) | 0.010 | 0.021 | 0.026 | 0.087 | 0.020 | 0.050 |
| Math Confidence (post) | -0.030 | -0.069 | -0.028 | 0.060 | 0.051 | -0.009 |
| STEM Behavior & Motivation (post) | 0.002 | 0.106 | 0.036 | 0.097 | 0.080 | 0.130 |
| Military Settings Endorsement (post) | -0.103 | -0.016 | 0.007 | 0.089 | 0.054 | 0.096 |
| Program Evaluation (post) | -0.020 | 0.014 | -0.016 | 0.061 | 0.061 | 0.046 |

"It was very rewarding to see the student's enthusiasm and the strong rapport with the instructors/teachers. As an engineer, I am likely biased but would have to say this is one of the best experiences you could provide a child to peak their interest in science, math and engineering."

Jason Storms, Parent of a student at DoD STARBASE Vermont - Burlington, Burlington, VT

**Pearson Correlation Matrix (Continued)**

| | High Military Attitude | Post Total Knowledge | Post STEM Concept | Post Future Plan | Post Science Confidence |
|---|---|---|---|---|---|
| Gender | | | | | |
| Grade | | | | | |
| Age | | | | | |
| I heard about DoD STARBASE before I knew I was coming here. | | | | | |
| I know someone that went through DoD STARBASE before me. | | | | | |
| I have met military people before coming to DoD STARBASE. | | | | | |
| High Military Attitude | 1.000 | | | | |
| Total Knowledge (post) | 0.098 | 1.000 | | | |
| STEM Concept Awareness (post) | 0.362 | 0.124 | 1.000 | | |
| Future Planning (post) | 0.406 | 0.210 | 0.590 | 1.000 | |
| Science Confidence (post) | 0.267 | 0.179 | 0.424 | 0.651 | 1.000 |
| Math Confidence (post) | 0.255 | 0.044 | 0.283 | 0.349 | 0.314 |
| STEM Behavior & Motivation (post) | 0.473 | 0.294 | 0.458 | 0.639 | 0.488 |
| Military Settings Endorsement (post) | 0.908 | 0.091 | 0.372 | 0.429 | 0.288 |
| Program Evaluation (post) | 0.288 | 0.130 | 0.311 | 0.388 | 0.352 |

**Pearson Correlation Matrix (Continued)**

| | Post Match Confidence | Post STEM Behavior & Motivation | Post Military Endorse | Post Program Evaluation |
|---|---|---|---|---|
| Gender | | | | |
| Grade | | | | |
| Age | | | | |
| I heard about DoD STARBASE before I knew I was coming here. | | | | |
| I know someone that went through DoD STARBASE before me. | | | | |
| I have met military people before coming to DoD STARBASE. | | | | |
| High Military Attitude | | | | |
| Total Knowledge (post) | | | | |
| STEM Concept Awareness (post) | | | | |
| Future Planning (post) | | | | |
| Science Confidence (post) | | | | |
| Math Confidence (post) | 1.000 | | | |
| STEM Behavior & Motivation (post) | 0.281 | 1.000 | | |
| Military Settings Endorsement (post) | 0.285 | 0.465 | 1.000 | |
| Program Evaluation (post) | 0.224 | 0.406 | 0.384 | 1.000 |

*Correlations of r>=.008 are statistically significant, p < .05*

"The DoD STARBASE program helped my son make that real world connection as to the importance of math and science, more specifically math since it is the subject he struggles with. Since the start of the program, I have noticed that he puts a little more effort into learning math. Thank you for this kind of program, I'm pretty sure my son isn't the only one showing these changes."

Parent of a participating student at DoD STARBASE Arizona, Tucson, AZ

**Appendix G:**
**Kendall's Tau-B Correlation Matrix for Post-Program Student Knowledge**

**Kendall's Tau-B Correlation Matrix**

| | Grade | Age | | Gender | 1 Sodium and chloride bond to form salt (NaCL)... | 2 By constructing a 3D scale model of a car, a person... | 3 Why are prototypes a key part of the engineering... |
|---|---|---|---|---|---|---|---|
| Grade | 1.000 | | | | | | |
| Age | 0.333 | 1.000 | | | | | |
| Gender | 0.003 | -0.096 | 1.000 | | | | |
| 1 | Sodium and chloride bond to form salt (NaCl). What does this bonded substance represent? | 0.206 | 0.034 | -0.002 | 1.000 | | |
| 2 | By constructing a 3D scale model of a car, a person can learn all of the following EXCEPT: | 0.061 | 0.006 | -0.015 | 0.158 | 1.000 | |
| 3 | Why are prototypes a key part of the engineering design process? | 0.044 | -0.021 | -0.040 | 0.169 | 0.104 | 1.000 |
| 4 | Which of the following is typically measured in nanometers? | 0.045 | -0.027 | -0.030 | 0.213 | 0.126 | 0.166 |
| 5 | Which pie chart represents the correct composition of air? | 0.096 | 0.007 | 0.021 | 0.235 | 0.078 | 0.160 |
| 6 | Two boats are floating by each other and passing cargo from one boat to the other. Based on Bernoulli's Principle, what happens i... | 0.012 | -0.009 | 0.042 | 0.106 | 0.156 | 0.112 |
| 7 | You are working on a new product to melt snow and ice on walkways. You test the product by measuring the time it takes for the area… | 0.109 | -0.026 | -0.020 | 0.185 | 0.155 | 0.195 |
| 8 | Which of the following would be a good reason to use latitude and longitude coordinates? | 0.152 | -0.014 | -0.006 | 0.130 | 0.132 | 0.177 |
| 9 | In the graph above, find the letter that is at the coordinates (3,-2). Is it A, B, C, or D? | 0.134 | -0.018 | -0.016 | 0.175 | 0.083 | 0.142 |
| 10 | Which of the following is an example of physical change? | 0.133 | 0.031 | -0.028 | 0.259 | 0.162 | 0.183 |
| 11 | When using computer design software to build a model, the first step is to… | 0.088 | -0.045 | -0.004 | 0.107 | 0.101 | 0.123 |
| 12 | Of the following, which tool would be appropriate to measure the volume of a glass of milk? | 0.058 | -0.002 | 0.004 | 0.209 | 0.072 | 0.139 |
| 13 | What scientific law makes it important to wear a seat belt? | 0.057 | 0.000 | -0.014 | 0.128 | 0.041 | 0.116 |
| 14 | Which of the following states of matter have the least amount of kinetic energy? | 0.115 | 0.028 | 0.009 | 0.226 | 0.130 | 0.150 |

**Kendall's Tau-B Correlation Matrix (Continued)**

| | | Grade | Age | Gender | 1 By constructing a 3D scale model of a car, a person... | 2 Why are prototypes a key part of the engineering... | 3 |
|---|---|---|---|---|---|---|---|
| 15 | An engineer is testing how well three different towels absorb liquids over three trials. The data for the experiment is in the tab... | 0.070 | -0.016 | 0.070 | 0.130 | 0.085 | 0.123 |
| 16 | STEM (Science, Technology, Engineering, and Math) jobs can involve which of the following? | 0.099 | -0.008 | 0.037 | 0.142 | 0.100 | 0.116 |
| 17 | You start out at the star (coordinates -1,3) and walk two kilometers North, then 1 Kilometer West and stop for lunch. After lunch,… | 0.120 | -0.002 | -0.032 | 0.101 | 0.143 | 0.053 |

**Kendall's Tau-B Correlation Matrix (Continued)**

| | | 4 Which of the following is typically measured... | 5 Which pie chart represents the the correct... | 6 Two boats are are floating by each other and... | 7 You are working on a new product to melt... |
|---|---|---|---|---|---|
| Grade | | | | | |
| Age | | | | | |
| Gender | | | | | |
| 1 | Sodium and chloride bond to form salt (NaCl). What does this bonded substance represent? | | | | |
| 2 | By constructing a 3D scale model of a car, a person can learn all of the following EXCEPT: | | | | |
| 3 | Why are prototypes a key part of the engineering design process? | | | | |
| 4 | Which of the following is typically measured in nanometers? | 1.000 | | | |
| 5 | Which pie chart represents the correct composition of air? | 0.240 | 1.000 | | |
| 6 | Two boats are floating by each other and passing cargo from one boat to the other. Based on Bernoulli's Principle, what happens if… | 0.159 | 0.234 | 1.000 | |
| 7 | You are working on a new product to melt snow and ice on walkways. You test the product by measuring the time it takes for the area… | 0.185 | 0.174 | 0.130 | 1.000 |
| 8 | Which of the following would be a good reason to use latitude and longitude coordinates? | 0.146 | 0.166 | 0.098 | 0.226 |

*Continued on next page*

**Kendall's Tau-B Correlation Matrix (Continued)**

| | | 4 Which of the following is typically measured... | 5 Which pie chart represents the the correct... | 6 Two boats are are floating by each other and... | 7 You are working on a new product to melt... |
|---|---|---|---|---|---|
| 9 | In the graph above, find the letter that is at the coordinates (3,-2). Is it A, B, C, or D? | 0.121 | 0.115 | 0.003 | 0.149 |
| 10 | Which of the following is an example of physical change? | 0.237 | 0.215 | 0.138 | 0.187 |
| 11 | When using computer design software to build a model, the first step is to… | 0.107 | 0.100 | 0.048 | 0.147 |
| 12 | Of the following, which tool would be appropriate to measure the volume of a glass of milk? | 0.108 | 0.159 | 0.110 | 0.193 |
| 13 | What scientific law makes it important to wear a seat belt? | 0.089 | 0.142 | 0.092 | 0.140 |
| 14 | Which of the following states of matter have the least amount of kinetic energy? | 0.176 | 0.214 | 0.128 | 0.190 |
| 15 | An engineer is testing how well three different towels absorb liquids over three trials.The data for the experiment is in the tab… | 0.063 | 0.135 | 0.097 | 0.161 |
| 16 | STEM (Science, Technology, Engineering, and Math) jobs can involve which of the following? | 0.071 | 0.147 | 0.057 | 0.174 |
| 17 | You start out at the star (coordinates -1,3) and walk two kilometers North, then 1 Kilometer West and stop for lunch. After lunch,… | 0.093 | 0.099 | 0.098 | 0.133 |

**Kendall's Tau-B Correlation Matrix (Continued)**

| | | 8 Which of the following would be a good reason to use... | 9 In the graph above, find the letter that is at the coordinates... | 10 Which of the following is an example of physical... | 11 When using computer design software to build a... | 12 Of the following which tool would be appro... |
|---|---|---|---|---|---|---|
| Grade | | | | | | |
| Age | | | | | | |
| Gender | | | | | | |
| 1 | Sodium and chloride bond to form salt (NaCl). What does this bonded substance represent? | | | | | |
| 2 | By constructing a 3D scale model of a car, a person can learn all of the following EXCEPT: | | | | | |
| 3 | Why are prototypes a key part of the engineering design process? | | | | | |
| 4 | Which of the following is typically measured in nanometers? | | | | | |
| 5 | Which pie chart represents the correct composition of air? | | | | | |

**Kendall's Tau-B Correlation Matrix (Continued)**

| | | 8 Which of the following would be a good reason to use... | 9 In the graph above, find the letter that is at the coordinates... | 10 Which of the following is an example of physical... | 11 When using computer design software to build a... | 12 Of the following which tool would be appro... |
|---|---|---|---|---|---|---|
| 6 | Two boats are floating by each other and passing cargo from one boat to the other. Based on Bernoulli's Principle, what happens i… | | | | | |
| 7 | You are working on a new product to melt snow and ice on walkways. You test the product by measuring the time it takes for the area… | | | | | |
| 8 | Which of the following would be a good reason to use latitude and longitude coordinates? | 1.000 | | | | |
| 9 | In the graph above, find the letter that is at the coordinates (3,-2). Is it A, B, C, or D? | 0.144 | 1.000 | | | |
| 10 | Which of the following is an example of physical change? | 0.146 | 0.171 | 1.000 | | |
| 11 | When using computer design software to build a model, the first step is to…— | 0.111 | 0.126 | 0.106 | 1.000 | |
| 12 | Of the following, which tool would be appropriate to measure the volume of a glass of milk? | 0.095 | 0.094 | 0.264 | 0.144 | 1.000 |
| 13 | What scientific law makes it important to wear a seat belt? | 0.122 | 0.131 | 0.144 | 0.120 | 0.192 |
| 14 | Which of the following states of matter have the least amount of kinetic energy? | 0.140 | 0.157 | 0.242 | 0.126 | 0.185 |
| 15 | An engineer is testing how well three different towels absorb liquids over three trials. The data for the experiment is in the tab... | 0.095 | 0.076 | 0.136 | 0.099 | 0.154 |
| 16 | STEM (Science, Technology, Engineering, and Math) jobs can involve which of the following? | 0.098 | 0.088 | 0.213 | 0.034 | 0.131 |
| 17 | You start out at the star (coordinates -1,3) and walk two kilometers North, then 1 Kilometer West and stop for lunch. After lunch,.. | 0.099 | 0.163 | 0.137 | 0.028 | 0.143 |

**Kendall's Tau-B Correlation Matrix (Continued)**

| | | 13 What scientific law makes it important to wear a... | 14 Which of the following states of matter have the... | 15 An engineer is testing how well three different... | 16 STEM (Science, Technology, Engineering, and Math)... | 17 You start out at the star (coordinates 1, 3) and walk... |
|---|---|---|---|---|---|---|
| Grade | | | | | | |
| Age | | | | | | |
| Gender | | | | | | |
| 1 | Sodium and chloride bond to form salt (NaCl). What does this bonded substance represent? | | | | | |
| 2 | By constructing a 3D scale model of a car, a person can learn all of the following EXCEPT: | | | | | |
| 3 | Why are prototypes a key part of the engineering design process? | | | | | |
| 4 | Which of the following is typically measured in nanometers? | | | | | |
| 5 | Which pie chart represents the correct composition of air? | | | | | |
| 6 | Two boats are floating by each other and passing cargo from one boat to the other. Based on Bernoulli's Principle, what happens i… | | | | | |
| 7 | You are working on a new product to melt snow and ice on walkways. You test the product by measuring the time it takes for the area… | | | | | |
| 8 | Which of the following would be a good reason to use latitude and longitude coordinates? | | | | | |
| 9 | In the graph above, find the letter that is at the coordinates (3,-2). Is it A, B, C, or D? | | | | | |
| 10 | Which of the following is an example of physical change? | | | | | |
| 11 | When using computer design software to build a model, the first step is to…— | | | | | |
| 12 | Of the following, which tool would be appropriate to measure the volume of a glass of milk? | | | | | |
| 13 | What scientific law makes it important to wear a seat belt? | 1.000 | | | | |
| 14 | Which of the following states of matter have the least amount of kinetic energy? | 0.157 | 1.000 | | | |
| 15 | An engineer is testing how well three different towels absorb liquids over three trials. The data for the experiment is in the tab… | 0.115 | 0.112 | 1.000 | | |
| 16 | STEM (Science, Technology, Engineering, and Math) jobs can involve which of the following? | 0.065 | 0.118 | 0.161 | 1.000 | |
| 17 | You start out at the star (coordinates -1,3) and walk two kilometers North, then 1 Kilometer West and stop for lunch. After lunch,… | 0.080 | 0.071 | 0.122 | 0.114 | 1.000 |

**Appendix H:**
**DoD STARBASE Locations by Military Component and Region**

Locations Based on Military Component

AIR FORCE

- Alabama – STARBASE Maxwell
- Arizona – STARBASE Arizona
- Colorado – STARBASE Peterson AFB
- Massachusetts – STARBASE Hanscom
- New Mexico – New Mexico STARBASE La Luz
- Ohio – STARBASE Wright-Patt
- Utah – STARBASE Hill Screaming Eagles

AIR FORCE RESERVES

- Georgia – STARBASE Robins
- Georgia – STARBASE Savannah
- Louisiana – STARBASE Louisiana
- Texas – STARBASE Kelly

MARINES

- South Carolina – STARBASE MCAS Beaufort

NATIONAL GUARD

- California – STARBASE of California
- California – STARBASE Los Alamitos
- Connecticut – STARBASE Hartford
- Connecticut – STARBASE Waterbury
- Florida – STARBASE Florida
- Georgia – Peach State STARBASE
- Hawaii – STARBASE – Hawaii, Big Island
- Indiana – STARBASE Indiana
- Kansas – STARBASE Kansas City
- Kansas – STARBASE Manhattan
- Kansas – STARBASE Salina
- Kansas – STARBASE Topeka
- Kansas – STARBASE Wichita

NATIONAL GUARD (Continued)

- Louisiana – STARBASE Jackson Barracks
- Louisiana – Pelican State STARBASE
- Michigan – STARBASE Alpena
- Michigan – STARBASE Battle Creek
- Michigan – STARBASE One
- Montana – STARBASE Fort Harrison
- Montana – STARBASE Great Falls
- North Carolina – STARBASE Charlotte
- Oklahoma – STARBASE Oklahoma – Burns Flat
- Oklahoma – STARBASE Oklahoma – Fort Sill
- Oklahoma – STARBASE Oklahoma – Oklahoma City
- Oklahoma – STARBASE Oklahoma – Tulsa
- Oregon – STARBASE Kingsley
- Oregon – STARBASE Portland
- Puerto Rico – STARBASE Puerto Rico
- South Carolina – STARBASE Swamp Fox
- South Dakota – STARBASE NOVA Courage
- South Dakota – STARBASE NOVA Honor
- South Dakota – STARBASE Rapid City
- South Dakota – STARBASE Sioux Falls
- Texas – Texas STARBASE Austin
- Texas – Texas STARBASE Houston
- Vermont – STARBASE Vermont – Rutland
- Vermont – STARBASE Vermont – South Burlington
- Virginia – Winchester STARBASE Academy
- West Virginia – STARBASE Martinsburg
- West Virginia – STARBASE Martinsburg
- West Virginia – West Virginia STARBASE Academy
- Wisconsin – STARBASE Wisconsin
- Wyoming – Wyoming STARBASE Academy

**Appendix H:**
**DoD STARBASE Locations by Military Component and Region**

Locations Across DoD STARBASE Region, 2015

EAST

- Connecticut – STARBASE Hartford
- Massachusetts – STARBASE Hanscom
- Vermont – STARBASE Vermont – Rutland
- Vermont – STARBASE Vermont – South Burlington

SOUTH EAST

- Alabama – STARBASE Maxwell
- Florida – STARBASE Florida
- Georgia – Peach State STARBASE
- Georgia – STARBASE Robins
- Georgia – STARBASE Savannah
- North Carolina – STARBASE Charlotte
- South Carolina – STARBASE Swamp Fox

MIDWEST

- Indiana – STARBASE Indiana
- Kansas – STARBASE Kansas City
- Kansas – STARBASE Manhattan
- Kansas – STARBASE Salina
- Kansas – STARBASE Topeka
- Kansas – STARBASE Wichita
- Michigan – STARBASE Alpena
- Michigan – STARBASE Battle Creek
- Michigan – STARBASE One
- Minnesota – STARBASE Minnesota
- Ohio – STARBASE Wright-Patt
- South Dakota – STARBASE NOVA Courage
- South Dakota – STARBASE NOVA Honor
- South Dakota – STARBASE Rapid City
- South Dakota – STARBASE Sioux Falls
- Wisconsin – STARBASE Wisconsin

SOUTH

- Arizona – STARBASE Arizona
- Louisiana – STARBASE Jackson Barracks
- Louisiana – STARBASE Louisiana
- Louisiana – Pelican State STARBASE
- New Mexico – New Mexico STARBASE La Luz
- Oklahoma – STARBASE Oklahoma – Burns Flat
- Oklahoma – STARBASE Oklahoma – Fort Sill
- Oklahoma – STARBASE Oklahoma – Oklahoma City
- Oklahoma – STARBASE Oklahoma – Tulsa
- Puerto Rico – STARBASE Puerto Rico
- Texas – STARBASE Kelly
- Texas – Texas STARBASE Austin
- Texas – Texas STARBASE Houston

WEST

- California – STARBASE Los Alamitos
- California – STARBASE of California
- Colorado – STARBASE Peterson AFB
- Hawaii – STARBASE – Hawaii, Big Island
- Montana – STARBASE Fort Harrison
- Montana – STARBASE Great Falls
- Oregon – STARBASE Kingsley
- Oregon – STARBASE Portland
- Utah – STARBASE Hill Screaming Eagles
- Wyoming – Wyoming STARBASE Academy

**Appendix I:**
**Ratings by Measurement Area**

| | | 2015 Mean | Standard Deviation | N |
|---|---|---|---|---|
| **STEM Concepts** | **Cronbach's Alpha Reliability .882 6 Items** | **6.37** | **.758** | **1668** |
| While attending DoD STARBASE, the students appear... | | | | |
| ... more interested in learning about technology. | | 6.51 | .857 | 1668 |
| ... more interested in learning about science. | | 6.46 | .882 | 1668 |
| ... more interested in learning about engineering. | | 6.17 | 1.055 | 1668 |
| ... more interested in learning about math. | | 5.93 | 1.258 | 1668 |
| DoD STARBASE has helped to improve the students' understanding of science. | | 6.64 | .729 | 1668 |
| DoD STARBASE has helped to improve students' appreciation of how math can be applied to a variety of situations. | | 6.49 | .862 | 1668 |
| **Confidence** | **Cronbach's Alpha Reliability .864 3 Items** | **6.12** | **.918** | **1668** |
| While attending DoD STARBASE, the students appear... | | | | |
| ... more willing to try new things. | | 6.40 | .918 | 1668 |
| ... more confident about what they can accomplish. | | 6.20 | 1.030 | 1668 |
| ... more comfortable making decisions. | | 5.77 | 1.146 | 1668 |
| **Behavioral/Motivational** | **Cronbach's Alpha Reliability .813 5 items** | **6.12** | **.884** | **1668** |
| While attending DoD STARBASE, the students appear... | | | | |
| ... more excited about learning. | | 6.27 | .982 | 1668 |
| ... better at following directions. | | 5.68 | 1.314 | 1668 |
| DoD STARBASE reinforces many positive behaviors I try to teach my students. | | 6.62 | .843 | 1668 |
| During DoD STARBASE, students have better school attendance. | | 6.10 | 1.327 | 1668 |
| The DoD STARBASE experience has influenced me to become skilled in STEM instruction. | | 5.94 | 1.294 | 1668 |
| **Teamwork** | **Cronbach's Alpha Reliability .918 3 items** | **5.99** | **1.043** | **1668** |
| While attending DoD STARBASE, the students appear... | | | | |
| ... more willing to cooperate with each other. | | 6.02 | 1.085 | 1668 |
| ... better at working in groups. | | 5.98 | 1.160 | 1668 |
| ... more likely to encourage each other. | | 5.96 | 1.132 | 1668 |
| **Future Planning** | **Cronbach's Alpha Reliability .920 4 items** | **5.83** | **1.062** | **1668** |
| While attending DoD STARBASE, the students appear... | | | | |
| ... more excited about their futures. | | 5.91 | 1.151 | 1668 |
| ... more ready to set future educational and career goals. | | 5.88 | 1.170 | 1668 |
| ... more goal oriented. | | 5.77 | 1.186 | 1668 |
| ... to focus more on their future potential. | | 5.77 | 1.222 | 1668 |

*Continued on next page*

**Appendix I: (Continued)**
**Ratings by Measurement Area**

| | | | 2015 Mean | Standard Deviation | N |
|---|---|---|---|---|---|
| **Military and Career** | **Cronbach's Alpha Reliability .746** | **5 items** | **5.78** | **.940** | **1668** |
| While attending DoD STARBASE, the students appear..... | | | | | |
| ... more comfortable with military personnel. | | | 5.87 | 1.250 | 1580 |
| ... to have more questions about DoD and other non-military career opportunities. | | | 5.67 | 1.340 | 1580 |
| ... more interested in learning about military careers. | | | 5.65 | 1.329 | 1580 |
| The students enjoyed being on a military base. | | | 6.79 | .709 | 1580 |
| Because of my participation in DoD STARBASE, I am more comfortable with military personnel. | | | 5.15 | 1.546 | 1580 |
| **Program/Resources Support** | **Cronbach's Alpha Reliability .784** | **7 items** | **6.35** | **.766** | **1668** |
| My school plans to participate in the DoD STARBASE program again next year. | | | 6.90 | .593 | 1393 |
| I look forward to bringing future classes to the DoD STARBASE program. | | | 6.85 | .561 | 1393 |
| Parents are delighted that their children are participating in DoD STARBASE. | | | 6.58 | .825 | 1393 |
| I would like more DoD STARBASE supplemental resources to take back to my classroom. | | | 6.45 | 1.031 | 1393 |
| My principal is a strong advocate of DoD STARBASE. | | | 6.34 | 1.114 | 1393 |
| I plan to incorporate DoD STARBASE teaching techniques into my daily classroom activities. | | | 6.21 | 1.148 | 1393 |
| I prefer the supplemental resources DoD STARBASE provides to teachers over other similar resources. | | | 5.88 | 1.332 | 1393 |
| **Post-program Impact** | **Cronbach's Alpha Reliability .934** | **10 items** | **6.18** | **.884** | **1008** |
| The students talk about DoD STARBASE long after the program has ended. | | | 6.63 | .828 | 648 |
| Attending DoD STARBASE helps students understand better how STEM skills/abilities fit job requirements for certain career fields. | | | 6.56 | .857 | 648 |
| Attending DoD STARBASE helps students understand better that developing their current skills/abilities is necessary to have good future career choices. | | | 6.51 | .966 | 648 |
| Attending DoD STARBASE helps students link their experience to careers in both military and non-military positions. | | | 6.38 | 1.018 | 648 |
| After DoD STARBASE, students are more interested in using computers for class-related learning activities. | | | 6.29 | 1.235 | 648 |
| DoD STARBASE helped to improve cooperative learning in the classroom even after the program ended. | | | 6.14 | 1.132 | 648 |
| After the DoD STARBASE program, the students ask more questions about technology. | | | 6.13 | 1.120 | 648 |
| Students that have attended DoD STARBASE seem to perform better on standardized state assessments. | | | 5.84 | 1.386 | 648 |
| After DoD STARBASE attendance, there is increased participation in the Science Fair and other STEM-related challenge programs ( e.g., FIRST LEGO League, Odyssey of the Mind, Team America Rocket Competition, etc.). | | | 5.84 | 1.395 | 648 |
| After DoD STARBASE, students have better school attendance. | | | 5.64 | 1.439 | 648 |

## Appendix J:
## Definitions for Statistical Analyses within this Report

The following section provides a list of the statistical formulas that were used to calculate the data presented in this report.

1. Mean – Average value of a variable

   Xbar = ∑X/N

   xbar = the sample mean; xbar is generally represented by a capital 'X' with a bar or line over the top

   ∑X = the sum of all values of X

   N = the sample size

2. Standard deviation – Measure of the average deviation of each score from the mean

   s = [∑xi-xbar2/n-1]1/2

   n = the sample size

3. t-test – Tests the difference between two means

   t = Xbar1 – Xbar2/sx1bar-x2bar

   sx1bar-x2bar = the standard deviation of the difference between the two variables

4. Pearson's Correlation – Determines the relationship between two variables

   r12 = [[∑Y1*Y2 – ∑Y1*∑Y2/N]/N-1]/sy1sy2

   r = the statistical relationship of two variables

   Y = the values of the variables

   s = the standard deviation of the variables

5. Multiple Correlation (R) – Represents the correlation or statistical relationship between a set of variables and a single variable

6. Regression Equation – Determines what combination of variables can best predict the outcome for the dependent variable

   Y = a + b1*X1 + b2*X2 + ... + bp*Xp

   Y= the predicted value of the dependent variable

   a = the intercept value of Y when X=0

   b = the regression coefficients for the predictors

   X = the value of the predictor variable

## Appendix K: Glossary

Academy: See DoD STARBASE Academy.

Academy Performance Level: DoD STARBASE sites are evaluated using a performance assessment system that is composed of three progressive levels of program and organizational performance. Each level has a prescribed set of activities that range from obtaining adherence to the DoDI requirements that guide basic operating procedures and full installation of program delivery (Level I); to obtaining desirable operating applications, key planning strategies, and managerial efficiencies (Level II); and lastly, to exhibit advanced strategic program linkages and downstream relationships for promoting student skills and abilities in STEM-related activities (Level III).

American Indian or Alaska Native: A person having origins in any of the original peoples of North and South America (including Central America) who maintains cultural identification through tribal affiliation or community attachment.

Appropriations Act: An act of Congress that permits Federal agencies to incur obligations and to make payments out of the Treasury for specified purposes. An appropriations act is the most common means of providing budget authority.

Asian: A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian Subcontinent, including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.

At-Risk/At-Risk Youth: Being "at-risk means having one or more family background, or other factors, that have been found to predict a high rate of school failure at some time in the future. This "failure" generally refers to dropping out of high school before graduation but also can mean being retained within a grade from one year to the next. The risk factors include having a mother whose education is less than high school, living in a single-parent family, having an older sibling who dropped out of high school, changing schools two or more times other than for the normal progression (e.g. from elementary to middle school), having "C" or lower grades, repeating an earlier grade, receiving welfare assistance, being from a low socio-economic status family and living in a household where the primary language spoken is other than English.

Black or African American: A person having origins in any of the black racial groups of Africa.

Class: Within the context of a DoD STARBASE Academy, a class is a grouping of students. This group may not necessarily have been a homogenous entity prior to DoD STARBASE instruction; it may be a temporary grouping only for the purposes of assembling for the 20-hour minimum period of DoD STARBASE instruction.

Classroom Teacher: Teacher from schools who participate in DoD STARBASE classes.

Computer-Aided Design (CAD): A program that prepares individuals to apply technical skills and advanced computer software and hardware to the creation of graphic representations and simulations in support of engineering projects. This includes instruction in engineering graphics, two-dimensional and three-dimensional engineering design, solids modeling, engineering animation, computer-aided drafting (CAD), computer-aided design (CADD), and auto-CAD techniques..

Pro E (Pro/ENGINEER) is the CAD program used in DoD STARBASE programs.

Core Curriculum: The fixed course of study taught by all DoD STARBASE academies. (See DoD STARBASE Curriculum.)

Director: DoD STARBASE staff member responsible for a DoD STARBASE academy.

Disability: Any of the disabilities classified in the U.S. Department of Education's Office of Special Education Programs (OSEP), which collects information on students with disabilities as part of the implementation of the Individuals with Disabilities Education Act (IDEA). Categories of disabilities include autism, deaf-blindness, developmental delay, emotional disturbance, hearing impairment, intellectual disability, multiple disabilities, orthopedic impairment, other health impairment, specific learning disabilities, speech or language impairments, traumatic brain injury, visual impairments, and preschool disability.

DoD: Department of Defense.

DoD Instruction (DoDI): Document that implements policies, responsibilities, and procedures for executing the DoD STARBASE program.

DoD STARBASE Academy: A DoD STARBASE educational program held in a specific state location.

DoD STARBASE Curriculum: DoD STARBASE core curriculum is comprised of the following areas:

- Physics
  - A. Newton's Three Laws of Motion
  - B. Fluid Mechanics and Aerodynamics
- Chemistry Sciences
  - A. Building Blocks of Matter
  - B. Physical and Chemical Changes
  - C. Atmospheric Properties
- Technology
  - A. Innovations
  - B. Navigation and Mapping
- Engineering
  - A. Engineering Design Process (EDP)
  - B. 3-D Computer-Aided Design (3.0 hours as mandated by OASD /M&RA)
- Mathematics Operations & Applications
  - A. Numbers and Number Relationships
  - B. Measurement
  - C. Geometry
  - D. Data Analysis
- STEM Careers
  - A. STEM Careers on Military Facilities
  - B. Personal Investigations

DoD STARBASE Program: The DoD STARBASE program is authorized by Title 10, United State Code section 2193b as a DoD science, math, and technology education improvement program. The office of the Assistant Secretary of Defense for Manpower & Reserve Affairs, (OASD/M&RA) administers policy and oversight; the DoD components execute the program at DoD STARBASE academies. DoD STARBASE is funded by Congress as a Civil Military Program.

DoD STARBASE Site/Location: The location of a DoD STARBASE Academy where the program is taught.

Driver: Drivers identify a set of related attitudinal clusters for the student population (i.e. when the driver is present, the set of attitudes will most likely be present, or in reverse, when the condition in the list of attitudes are present the target "driver" attitude will also be present).

Elementary School: Elementary schools include regular schools (i.e., schools that are part of state and local school systems and private elementary, both religiously affiliated and nonsectarian); alternative schools and special education schools. Elementary schools typically host grades K–6 and do not have any grade higher than grade 8. For example, schools with grades K–6, 1–3, or K–8 are classified as elementary.

Ethnicity/Race: Categories developed in 1997 by the Office of Management and Budget (OMB) that are used to describe groups to which individuals belong, identify with, or belong in the eyes of the community. The categories do not denote scientific definitions of anthropological origins. The designations are used to categorize U.S. citizens, resident aliens, and other eligible non-citizens. Individuals are asked to first designate ethnicity as: Hispanic or Latino or Non-Hispanic or Latino. Second, individuals are asked to indicate one or more races that apply among the following: American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, White.

Expenditures: Charges incurred, whether paid or unpaid.

Expenditures Per Pupil: Charges incurred for a particular period of time divided by a student unit of measure, such as enrollment, average daily attendance, or average daily membership.

Fiscal Year or FY: The yearly accounting period for the federal government, which begins on October 1 and ends on the following September 30. The fiscal year is designated by the calendar year in which it ends; for example, fiscal year 2015 begins on October 1, 2014, and ends on September 30, 2015.

Gap Score: Difference between pre-program and post-program test scores.

Graduate: An individual who has received formal recognition for the successful completion of a prescribed program of studies.

High School: A secondary school offering the final years of high school study necessary for graduation, in which the lowest grade is not lower than grade 9. Usually includes grades 10, 11, and 12 or grades 9, 10, 11, and 12. They may also be defined as a school with no grade lower than 7 and at least one grade higher than 8. This includes regular schools (i.e. schools that are part of state and local school systems and private secondary schools, both religiously affiliated and nonsectarian, alternative schools, vocational education schools, and special education.

Hispanic or Latino: A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race.

Inquiry-Based Learning: A student-centered educational approach which focuses on using and learning content as a means to develop information-processing and problem-solving skills. In this approach the teacher acts as a facilitator. Students are involved in the building of knowledge through active involvement.

Instructor: DoD STARBASE educator.

Kindergarten: Includes transitional kindergarten, kindergarten, and pre-1st grade students.

Location: See DoD STARBASE Site/Location.

Mapping: The process of using maps to chart a course.

Mathematics: The study of the measurement, properties, and relationships of quantities and sets, using numbers and symbols. A body of related courses concerned with knowledge of measurement, properties, and relations quantities, which can include theoretical or applied studies of arithmetic, algebra, geometry, trigonometry, statistics, and calculus.

Middle School: A school with no grade lower than 5 and no grade higher than 8. This includes regular schools (i.e. schools that are part of state and local school systems and private secondary schools, both religiously affiliated and nonsectarian, alternative schools, vocational education schools and special education.

Minority: Racial and ethnic minority populations are defined as: Asian American, Black or African American, Hispanic or Latino, Native Hawaiian and Other Pacific Islander, American Indian and Alaska Native.

Nanotechnology: The science of manipulating materials on an atomic or molecular scale, especially to build microscopic devices.

National School Lunch Program: Established by President Truman in 1946, the program is a Federally assisted meal program operated in public and private nonprofit schools and residential child care centers. To be eligible for free lunch, a student must be from a household with an income at or below 130 percent of the Federal poverty guideline; to be eligible for reduced-price lunch, a student must be from a household with an income between 130 percent and 185 percent of the Federal poverty guideline.

Native American: See American Indian or Alaska Native.

Native Hawaiian or Other Pacific Islander: A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.

Navigation: The theory, practice and technology of charting a course for a ship, aircraft or a spaceship.

Not-For-Profit Organization: A legal entity recognized or chartered by competent state authority and to which the Internal Revenue Service has given status as a 501(c)(3) tax-exempt non-profit organization.

OASD/M&RA: Office of the Assistant Secretary of Defense for Manpower & Reserve Affairs.

Operational Academies: An academy that is processing students.

Participant: A DoD STARBASE student. Participant also refers to military command support units, the local sponsoring base command, community leaders, local community sponsoring committees, school systems, schools, teachers, military service volunteers, DoD STARBASE Board members, staff, and parents.

Pre/Post: Prior to the start of the program and at the completion of the program.

Program Year: The DoD STARBASE program year is the same as the Government fiscal year, October 1 – September 30.

Public School: A school that provides educational services for at least one of grades K–12 (or comparable ungraded levels), has one or more teachers to give instruction, has an assigned administrator, receives public funds as primary support, and is operated by an education or chartering agency. Public schools include regular, special education, vocational/technical, alternative, and charter schools. They also include schools in juvenile detention centers, schools located on military bases and operated by the Department of Defense, and Bureau of Indian Education-funded schools operated by local public school districts.

Race/Ethnicity: Categories developed in 1997 by the Office of Management and Budget (OMB) that are used to describe groups to which individuals belong, identify with, or belong in the eyes of the community. The categories do not denote scientific definitions of anthropological origins. The designations are used to categorize U.S. citizens, resident aliens, and other eligible non-citizens. Individuals are asked to first designate ethnicity as: Hispanic or Latino or Non-Hispanic or Latino. Second, individuals are asked to indicate one or more races that apply among the following: American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, White.

Race/Ethnicity Unknown: The category used to report students or employees whose race and ethnicity are not known.

Rural Location: All population, housing and territory not included within an urbanized area. Whatever is not urban is considered rural.

Salary: The total amount regularly paid or stipulated to be paid to an individual, before deductions, for personal services rendered while on the payroll of a business or organization.

School District: An education agency at the local level that exists primarily to operate public schools or to contract for public school services.

Science: The body of related course concerned with knowledge of the physical and biological world and with the processes of discovering and validating this knowledge.

Secondary School: A school with one or more of grades 7–12 that does not have any grade lower than grade 7. For example, schools with grades 9–12, 7–9, 10–12, or 7–8 are classified as secondary.

Site: See DoD STARBASE Site/Location.

STEM: Science, Technology, Engineering, and Mathematics (STEM) fields of study that are considered to be of particular relevance to advanced societies.

Supplemental Programs: These are programs that for one reason or another (e.g. below minimum hours, do not cover the core curriculum areas, etc.) do not meet DoDI standards. They are more diverse than traditional DoD STARBASE programs, are often conducted during the summer months and may be designed to reach students who do not fall under the targeted "participant" schools or are in response to requests by members of the community to serve other groups of children. Supplemental programs are not required and are beyond the normal operation and obligations of the academy. In many cases, supplemental programs are established in response to the demand created by the popularity and success of the DoD STARBASE program within the community.

Teacher Certification: License granted by states for teachers to teach a given subject. These vary by state, but generally include: obtaining a bachelor's degree; completing a teacher preparation program, which includes either an undergraduate, master's, or alternative program; and getting state or national certification to teach by completing all requirements.

**Title 1 or Title 1 Eligible:** The federal government provides grants to local education agencies to supplement state and local education funding based primarily on the number of children from low-income families in each local education agency. The program provides extra academic support and learning opportunities to help disadvantaged students catch up with their classmates or make significant academic progress.

**Urban Area (UA)**: Consists of 50,000 or more people.

**Urban Cluster (UC):** Consists of at least 2,500 and less than 50,000 people.

**White:** A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.

"I came four years ago with my other son. I thought it was an awesome experience then and if anything the experience has improved. I think it is great how the kids get all of the hands on experiences to help them better understand how all of this applies to real life situations..."

Sarah Horn, Parent of a student participating at DoD STARBASE Topeka, Topeka, KS

# DoD STARBASE Directory

## ALABAMA

*MONTGOMERY*

STARBASE Maxwell
Service Component: Air Force
Military Location: Maxwell Air Force Base
Address:
60 W. Maxwell Boulevard, Building 835
Montgomery, Alabama 36116
Tel: 334-953-4821
Fax: None
Director: Princess J. Cuthrell
Email: princess@montgomeryed.org
Website: None

*Autauga County*
Autaugaville
Billingsley School

*Elmore County*
Eclectic Middle School
Holtville Middle
Redland Elementary

*Maxwell AFB, Montgomery County*
Maxwell Elementary

*Montgomery County*
Brewbaker Intermediate
Southlawn Elementary
Vaughn Road Elementary
Wilson Elementary

## ARIZONA

*TUCSON*

STARBASE Arizona
Service Component: Air Force
Military Location: Davis-Monthan Air Force Base
Address:
5355 E. Granite Street
Tucson, Arizona 85707
Tel: 520-228-7827
Fax: None
Director: Mikelle Cronk
Email: cronkm@vail.k12.azus
Website: wwwfacebook.com/starbasearizona

*Amphitheater Unified School District*
F.O. Holaway Elementary School
Helen Keeling Elementary School
Lulu Walker Elementary School

*Presidio Charter Schools*
Presidio Elementary School

*Sunnyside Unified School District*
Mission Manor Elementary School

*Tucson Unified School District*
J.B. Wright Elementary School

*Vail Unified School District*
Acacia Elementary School
Desert Willow Elementary School
Esmond Station K-8 School
Sycamore Elementary School

## CALIFORNIA

*LOS ALAMITOS*

STARBASE Los Alamitos*
Service Component: National Guard
Military Location: Joint Forces Training Base Los Alamitos
Address:
11525 Freedom Way
Los Alamitos, California 90720
Tel: 562-795-1473
Fax: None
Director: Stacey Hendrickson
Email: stacey.hendrickson.nfg@mail.mil
Website: www.starbaselosalamitos.com

*Compton Unified*
Compton Unified School District

*Fullerton Unified School District*
Pacific Drive Elementary
Richman Elementary
Woodcrest Elementary

*Long Beach Unified*
Prisk

*Los Angeles Unified*
112th Street Elementary
92nd Street Elementary
93rd Street Elementary
96th Street Elementary
Bushnell Way Elementary
Christopher Dena Elementary

** Indicates location, also coordinates a DoD STARBASE 2.0 Program*

Flournoy Elementary
Grape Street Elementary
Sunrise Elementary

*Private School*
Dolores Mission
St. Michael's Catholic School

*Santa Ana Unified*
Diamond Elementary
John Adams Elementary
John F. Kennedy Elementary
Lincoln Elementary
Lowell Elementary
Martin Luther King Elementary
Monte Vista Elementary
Pio Pico Elementary
Remington Elementary
Sepulveda Elementary

*SACRAMENTO*

STARBASE Sacramento
Service Component: National Guard
Military Location: Okinawa California National Guard Armory
Address:
8400 Okinawa Street
Sacramento, California 95828
Tel: 916-387-7405
Fax: 916-387-8309
Director: Capt Kel K. Thede
Email: kel.thede.1@ang.af.mil
Website: Pending

*Elk Grove Unified*
Elliott Ranch Elementary School
Florence Markofer Elementary School
John Reith Elementary School
Prairie Elementary School
Union House Elementary School

*Folsom Cordova Unified*
Cordova Villa Elementary School
Mather Heights Elementary School

*Sacramento City Unified*
Martin Luther King Junior School

## COLORADO

*COLORADO SPRINGS*

STARBASE Peterson Air Force Base
Service Component: Air Force
Military Location: Peterson Air Force Base
Address:
710 Loring Street
Colorado Springs, Colorado 80914
Tel: 719-556-9500
Fax: 719-556-9538
Director: Patty Smathers
Email: patricia.smathers.1.ctr@us.af.mil
Website: None

Colorado Springs School District Eleven
Christa McAuliffe Elementary At Cimarron Hills
Helen Hunt Elementary School
James Monroe Elementary School
Mark Twain Elementary School

Thomas A. Edison Elementary School
Will Rogers Elementary School

## CONNECTICUT

*HARTFORD*

STARBASE Connecticut - Windsor Locks*
Service Component: National Guard
Military Location: Bradley Air National Guard Base, Windsor Locks Readiness Center
Address:
85 Light Lane
Windsor Locks, Connecticut 06096
Tel: 860-292-4678
Fax: None
Director: Melissa Vanek
Email: mvanek@starbase-ct.com
Website: www.starbase-ct.com

*East Hartford Public Schools*
Anna E. Norris

*Franklin H. Mayberry School*
Gov. William Pitkin School
Hockanum School
John A. Langford School
Joseph O. Goodwin School
O'Connell School
Robert J. O'Brien Stem Academy
Silver Lane School

** Indicates location, also coordinates a DoD STARBASE 2.0 Program*

Sunset Ridge School
Woodland School

*Harford Public School*
Alfred E. Burr School
Jumoke Academy
R. J. Kinsella School Of Performing Arts

*WATERBURY*

STARBASE Connecticut - Waterbury
Service Component: National Guard
Military Location: Off-Base
Address:
750 Chase Parkway
Waterbury, Connecticut 06708
Tel: 203-575-8271
Fax: None
Director: Melissa Vanek
Email: mvanek@starbase-ct.com
Website: www.starbase-ct.com

*Waterbury Parochial Schools*
Our Lady Of Mount Carmel
Yeshiva K'tana School

*Waterbury Private School*
Children's Community School

*Waterbury Public Schools*
Bucks Hill Elementary School
Bunker Hill Elementary School
Carrington Elementary School
Chase Elementary School
Driggs Elementary School
Duggan Elementary School
Generali Elementary School
Gilmartin Elementary School
Hopeville Elementary School
Kingsbury Elementary School
Maloney Elementary School
Reed Elementary School
Regan Elementary School
Rotella Elementary School
Sprague Elementary School
Tinker Elementary School
Walsh Elementary School
Washington Elementary School
Wendell Cross Elementary School
Woodrow Wilson Elementary School

## FLORIDA

*JACKSONVILLE*

STARBASE Florida
Service Component: National Guard
Military Location: 125th Fighter Wing Fang
Address:
14300 FANG Drive
Jacksonville, Florida 32218
Tel: 904-741-7320
Fax: 904-741-7324
Director: Greg Stritch
Email: gregory.stritch@ang.af.mil
Website: None

*Duval County Public Schools*
Andrew Robinson
Center Academy
Hendricks Avenue
Jacksonville Heights
John Love
Normandy Village
Oak Hill
Parkwood Heights
Pine Estates
Ruth Upson
Seacoast Charter Academy
Sonshine Academy
Southside Estates
Susie Tolbert
West Riverside

## GEORGIA

*MARIETTA*

Peach State STARBASE
Service Component: National Guard
Military Location: Clay National Guard Center/
Dobbins Air Reserve Base
Address:
1484 Patrol Road
Dobbins ARB, Georgia 30069
Tel: 678-569-3568
Fax: None
Director: John Mckay
Email: john.e.mckay8.nfg@mail.mil
Website: www.facebook.com/peachstatestarbase

*Cobb County School District*
Harmony Leland Elementary School
Labelle Elementary School
Mableton Elementary School

Russell Elementary School
Tritt Elementary School

*Homeschool Group*
Forsyth County Christian Homeschool Group
Great Oak Academy

*Marietta City Schools*
Dunleith Elementary School
Hickory Hills Elementary School
Lockheed Elementary School
Sawyer Road Elementary School

*Private School*
Cumberland Christian Academy

*SAVANNAH*

STARBASE Savannah*
Service Component: Army
Military Location: Hunter Army Air Field
Address:
134 Macarthur Circle
Savannah, Georgia 31409
Tel: 912-315-3749
Fax: 912-315-3748
Director: Betty L. G. Morgan
Email:bmormicmou@aol.com
Website: savannahstarbase.weebly.com/index.html

*Candler County*
Metter Intermediate

*Chatham County*
Calvary Day
Charles Ellis
East Broad
Hubert Middle
Jacob G. Smith
Pulaski
Ramah Jr Academy
Savannah Christian Preparatory
Thunderbolt
Virginia Heard
West Chatham

*Liberty County*
Brittin Elementary
Diamond Elementary

*WARNER ROBINS*

STARBASE Robins*
Service Component: Air Force Reserve
Military Location: Robins Air Force Base
Address:
1842 Heritage Boulevard
Warner Robins, Georgia 31098
Tel: 478-926-1769
Fax: None
Director: Wesley Fondal, Jr.
Email: wesley@starbaserobins.org
Website: www.starbaserobins.org

*Bibb School District*
Alexander II Elementary
Bruce Elementary
Burghard Elementary
Jones Elementery
Porter Elementary
Vineville Academy

*Houston School District*
Centerville Elementary
Eagle Springs Elementary
Hilltop Elementary
Lindsey Elementary
Miller Elementary
Northside Elementary
Pearl Stephens Ementary
Quail Run Elementary
Russell Elementary
Shirley Hill's Elementary
Westside Elementary

*Twiggs School District*
Twiggs Co. Jeffersonville Elementary

## HAWAII

*KEAAU*

STARBASE Hawaii - Big Island
Service Component: National Guard
Military Location: Keaau Armory
Address:
16-512 Volcano Highway
Keaau, Hawaii 96749
Tel: 808-982-4298
Fax: 808-982-4241
Director: Todd Friel
Email: starbasehi@aol.com
Website: None

** Indicates location, also coordinates a DoD STARBASE 2.0 Program*

*Hilo Complex*
Waiakea Elementary

*Hilo Private School*
Haili Christian School
St. Joseph School

*Ka'u-Kea'au-Pahoa Complex*
Kea'au Elementary
Keonepoko Elementary
Mt. View Elementary
Na'alehu Elementary
Pahala Elementary
Pahoa Elementary

*Puna Charter School*
Hawaii Academy Of Arts And Science
Ke Kula O Nawahiokalaniopu'u
Na Wai Ola Public Charter School
Volcano School Of Arts And Science

## INDIANA

*FORT WAYNE*

STARBASE Indiana - Fort Wayne*
Service Component: National Guard
Military Location: 122 Fighter Wing
Address:
3005 W. Ferguson Road
Fort Wayne, Indiana 46809
Tel: 260-478-3702
Fax: None
Director: Scott Liebhauser
Email: scott@starbasein.org
Website: www.starbasein.org

*Diocese Of Fort Wayne*
Most Precious Blood School
Saint Aloysius School
Saint Joseph Hessen Cassel
St. Elizabeth Ann Seton
St. Joseph

*East Allen County Schools*
Heritage Elementary

*Fort Wayne Community Schools*
Bloomingdale Elementary
Glenwood Park Elementary
Indian Village Elementary
John S. Irwin Elementary School
Levan Scott Academy
Maplewood Elementary
South Wayne
Study Elementary
Washington Elementary
Weisser Park Elementary (Magnet)

*Fort Wayne Lutheran Schools*
Emmaus Lutheran School
Saint Paul's Lutheran School
Suburban Bethlehem Lutheran

*Noble County Private School*
Cornerstone Christian School

*INDIANAPOLIS*

STARBASE Indianapolis
Service Component: National Guard
Military Location: Joint Forces Headquarters, Indiana
Address:
2002 S. Holt Road
Indianapolis, Indiana 46241
Tel: 317-245-4047
Fax: 317-245-4049
Director: Scott Liebhauser
Email: scott@starbasein.org
Website: www.starbasein.org

*Catholic School*
Central Catholic School

*Greenwood Community School Corporation*
Northeast Elementary School
Southwest Elementary School
V. O. Isom Central Elementary School
Westwood Elementary School

*Indianapolis Public Schools*
Cold Spring School
Francis Scott Key School 103
Frederick Douglass School 19
George Washington Carver School 87
Merle Sidener Gifted Academy

*Washington Township School*
Greenbriar Elementary

** Indicates location, also coordinates a DoD STARBASE 2.0 Program*

## KANSAS

*KANSAS CITY*

STARBASE Kansas City
Service Component: National Guard
Military Location: 2-137th Infantry Regiment
Address:
100 S. 20th Street
Kansas City, Kansas 66102
Tel: 913-279-7858
Fax: 913-279-7859
Director: Karen Whitacre
Email: karen@kansasstarbase.org
Website: www.kansasstarbase.org

*Basehor Linwood School District*
Basehor Intermediate School
Glenwood Ridge Elementary School
Linwood Elementary School

*Blue Valley Schools*
Timber Creek Elementary School

*Easton Unified School District 449*
Pleasant Ridge Elementary School

*Kansas City Kansas Public Schools*
New Chelsea Elementary School
Parker Elementary School
Stony Point North Elementary School
Stony Point South Elementary School
T.A. Edison Elementary School
White Church Elementary School

*Lawrence Public Schools*
Pinckney Elementary School

*Lansing Unified School District 469*
Lansing Elementary School

*Leavenworth Unified School District 453*
Anthony Elementary School
David Brewer Elementary School
Henry Leavenworth Elementary School

*Private School*
John Paul II Catholic School
Kansas City Christian School
Shawnee Mission Christian School
Xavier Catholic School

*Shawnee Mission School District*
Nieman Elementary School
Pawnee Elementary School
Prairie Elementary School
Sante Fe Trail Elementary School

*MANHATTAN*

STARBASE Manhattan
Service Component: National Guard
Military Location: 130th Field Artillery Brigade
Address:
721 Levee Drive
Manhattan, Kansas 66502
Tel: 785-560-3525
Fax: 785-539-7810
Director: Rebecca Catlin
Email: becky@kansasstarbase.org
Website: www.kansasstarbase.org

*Flint Hills Christian School*
Flint Hills Christian School

*Geary County Schools Unified School District 475*
Franklin Elementary School
Ft. Riley Elementary School
Milford Elementary School
Seitz Elementary School
Sheridan Elementary School

*Kaw Valley Unified School District 321*
St. Marys Grade School

*Manhattan-Ogden Unified School District 383*
Amanda Arnold Elementary School
Bluemont Elementary School
Frank Bergman Elementary School
Lee Elementary School
Marlatt Elementary School
Northview Elementary School
Ogden Elementary School
Theodore Roosevelt Elementary School
Woodrow Wilson Elementary School

*Mill Creek Valley Unified School District 329*
Alma Grade School
Maple Hill Grade School

*Manhattan Catholic Schools*
Manhattan Catholic Schools

*Rock Creek Schools*
Westmoreland Elementary School

*St. John Lutheran School*
St. John Lutheran

*Unified School District 384 Blue Valley*
Blue Valley Randolph Middle School

*Unified School District 473 Public Schools*
Chapman Elementary School

*Unified School District 322 Onaga, Havensville, Wheaton*
Onaga Elementary School

*SALINA*

STARBASE Salina
Service Component: National Guard
Military Location: Great Plains Joint Training Center
Address:
3010 Arnold Street
Salina, Kansas 67401
Tel: 785-822-6602
Fax: 785-822-6600
Director: Dixie Tipling
Email: dixie@kansasstarbase.org
Website: www.kansasstarbase.org

*Abilene Unified School District 435*
Garfield Upper Elementary School

*Central Plains Unified School District 112*
Wilson Schools

*Chapman Unified School District 473*
Blue Ridge Elementary School
Enterprise Elementary School

*Clifton - Clyde Unified School District 224*
Clifton - Clyde Middle School
Concordia Unified School District 333
Concordia Middle School

*McPherson Unified School District 298*
Lincoln Elementary School
Lincoln Elementary School

*McPherson Unified School District 418*
Eisenhower Elementary School
Roosevelt Elementary School
Washington Elementary School

*Moundridge School District Unified School District 423*
Moundridge Middle School

*Private Schools*
Elyria Christian School
Mcpherson Area Home Educators
Salina Christian Academy

*Sylvan Unified School District 299*
Lucas / Sylvan Elementary School

*Salina Unified School District 305*
Coronado Elementary School
Grace E. Stewart Elementary School
Sunset Elementary School
Heusner Elementary School
Meadowlark Ridge Elementary School

*Smoky Valley Unified School District 400*
Smoky Valley Middle School

*Southern Cloud Unified School District 334*
Miltonvale Elementary School
Glasco Grade School

*Twin Valley Unified School District 240*
Bennington Grade School
Tescott Elementary School

*Unified School District 239 North Ottawa County Schools*
Minneapolis Grade School

*TOPEKA*

STARBASE Topeka
Service Component: National Guard
Military Location: 190th Air Refueling Wing
Address:
5920 SE Coyote Drive
Topeka, Kansas 66619
Tel: 785-861-4709
Fax: 785-861-4127
Director: Jeff Gabriel
Email: jeff@kansasstarbase.org
Website: www.kansasstarbase.org

*Archdiocese Of Kansas City Ks*
Christ The King Elementary
St. Matthew Catholic School

*Atchison County Community Schools Unified School District 377*
Atchison County Elementary School

*Auburn Washburn Unified School District 437*
Auburn Elementary
Farley Elementary
Indian Hills Elementary
Pauline South Intermediate

*Baldwin City Unified School District 348*
Baldwin Elementary Intermediate Center

*Burlingame Public School Unified School District 454*
Burlingame Elementary

*Central Heights Unified School District 288*
Central Heights Elementary

*Jefferson West Unified School District 340*
Jefferson West Elementary School

*Kaw Valley Unified School District 321*
Rossville Elementary

*Lyndon Unified School District 421*
Lyndon Elementary

*Mission Valley Unified School District 330*
Mission Valley Elementary

*Santa Fe Trail Unified School District 434*
Carbondale Attendance Center

*Seaman Unified School District 345*
Logan Elementary
North Fairview Elementary

*Topeka Public Schools Unified School District 501*
Eisenhower Middle School
Mceachron Elementary
Whitson Elementary

*Wamego Unified School District 320*
West Elementary

*WICHITA*

STARBASE Wichita
Service Component: National Guard
Military Location: McConnell Air Force Base
Address:
52870 Jayhawk Drive
Wichita, Kansas 67221
Tel: 316-759-8911
Fax: 316-759-8915
Director: Aaron Santry
Email: aaron@kansasstarbase.org
Website: www.kansasstarbase.org

*Andover Public Schools*
Cottonwood Elementary School

*Archdiocese Of Wichita*
Blessed Sacrament Catholic School
Holy Cross Catholic School

*Bluestem Public Schools*
Bluestem Elementary

*Burden Public Schools*
Central Elementary

*Circle Public Schools*
Cheney Elementary
Circle Towanda Elementary

*El Dorado Public Schools*
Lincoln Elementary School
Skelly Elementary School

*Halstead-Bentley Public Schools*
Halstead Middle School

*Haysville Public Schools*
Oatville Elementary
Ruth Clark Elementary

*Moundridge School District*
Moundridge Elementary

*Private Schools*
Central Christian Academy
Holy Cross Lutheran School

*Rose Hill Public Schools*
Rose Hill Intermediate School

*Wichita Public Schools*
Adams Elementary
Allen Elementary
Bostic Traditional Magnet Elementary School
Buckner Performing Arts Magnet Elementary School
Gammon Elementary
L'ouverture Computer Technology Magnet Elementary School
McColloum Elementary
Mueller Aerospace And Engineering Discovery Magnet Elementary School

## LOUISIANA

*BATON ROUGE*

Bayou State STARBASE
Service Component: National Guard
Military Location: Off-Base
Address:
13770 Highway 77
Rosedale, Louisiana 70772
Tel: 225-238-0250
Fax: None
Director: John J Meche
Email: johnmeche@lpsb.education
Website: None

*Iberville Parish*
Crescent Elementary
Iberville Math And Science Academy East

*BOSSIER CITY*

STARBASE Louisiana*
Service Component: Air Force Reserve
Military Location: Barksdale Air Force Base
Address:
827 Twining Drive
Barksdale AFB, Louisiana 71110
Tel: 318-529-3521
Fax: 318-529-3631
Director: Kathy Brandon
Email: kathy.brandon.2.ctr@us.af.mil
Website: www.307bw.afrc.af.mil/units/starbaselouisiana.aspx

*Bossier Parish Schools*
Apollo Elementary
Benton Elementary
Bossier Elementary
Carrie Martin Elementary
Central Park Elementary
Curtis Elementary
Elm Grove Elementary
Kerr Elementary
Legacy Elementary
Meadowview Elementary
Plantation Park Elementary
Princeton Elementary
Stockwell Place Elementary
W. T. Lewis Elementary
Waller Elementary

*Catholic Diocese Of Shreveport*
St. John Berchmans Cathedral School
St. Joseph Catholic School

*Caddo Parish Schools*
Cherokee Park Elementary
Claiborne Fundamental Elementary
Creswell Elementary
Judson Fundamental Magnet
Keithville Elementary
Mooringsport Elementary
North Highlands Elementary
Oil City Environmental Science Magnet
Shreve Island Elementary
Southern Hills Elementary
Summer Grove Elementary

*Private Schools*
First Baptist Church School
Word Of God Academy

*NEW ORLEANS*

STARBASE Jackson Barracks
Service Component: National Guard
Military Location: National Guard Jackson Barracks
Address:
6400 Saint Claude Avenue
New Orleans, Louisiana 70117
Tel: 504-278-8440
Fax: 504-278-8537
Director: Lisa Calabresi
Email: lisa.m.calabresi.nfg@mail.mil
Website: None

*Orleans Parish School District*
Ben Franklin Elementary Mathematics And Science School
Dr. King Charter School
Edgar P. Harney Spirit Of Excellence Academy
Esperanza Charter School
Martin Behrman Charter School Academy Of Creative Arts And Sciences
St. Paul Lutheran School

*Orleans School District*
Edward Hynes Charter School
Fannie C. Williams Charter School
James M. Singteton Charter School
McDonogh 42 Elementary Charter School
McDonogh 32 Literacy Charter School
St. Rita Catholic School

*Plaquemines Parish School District*
Belle Chasse Academy

*St. Bernard Parish School District*
Arabi Elementary
Lynn Oaks School
Our Lady Of Prompt Succor

** Indicates location, also coordinates a DoD STARBASE 2.0 Program*

*PINEVILLE*

Pelican State STARBASE*
Service Component: National Guard
Military Location: Camp Beauregard
Address:
609 F. Street
Pineville, Louisiana 71360
Tel: 318-290-5252
Fax: 318-290-5937
Director: Nancy B. Force
Email: nancy.l.brinkerhoffforce.nfg@mail.mil
Website: None

*Association Of Christian Schools International (ACSI)*
Grace Christian

*Cathollic Diocese*
Our Lady Of Prompt Succor
Sacred Heart
St. Francis Cabrini School

*Grant Parish*
Colfax Elementary
Pollock Elementary
South Grant Elementary

*Rapides Parish*
Acadian Elementary
Alma Redwine Elementary
Carter C. Raymond
D.F. Huddle Elementary
Glenmora School
Hadnot-Hayes Stem
Julius Patrick Elementary
L. S. Rugg Elementary
Lessie Moore Elementary
Mabel Brasher Elementary
Martin Park Elementary
North Bayourapides Elementary
Pineville Elementary
Plainview High School
Poland Jr. High
W. O. Hall

## MASSACHUSETTS

*BEDFORD*

STARBASE Hanscom
Service Component: Air Force
Military Location: Hanscom Air Force Base
Address:
98 Barksdale Street
Hanscom AFB, Massachusetts 01730
Tel: 781-862-4015
Fax: 781-862-4016
Director: Peter Holden Phd
Email: pholden@mass-starbase.org
Website: www.mass-starbase.org

*Ayer-Shirley Regional School District*
Lura A. White School
Page-Hilltop School

*Boston Public Schools*
Nathan Hale School
Sarah Greenwood School

*Fitchburg Public Schools*
Arthur M. Longsjo Jr. Middle School

*Haverhill Public Schools*
Dr. AB Consentino Middle School

*Leominster Public Schools*
Fall Brook Elementary School
Francis Drake Elementary School
Johnny Appleseed Elementary School
Northwest Elementary School

*Lincoln Public Schools*
Hanscom Middle School

*Malden Public Schools*
Linden Steam Academy

** Indicates location, also coordinates a DoD STARBASE 2.0 Program*

## MICHIGAN

*ALPENA*

STARBASE Alpena
Service Component: National Guard
Military Location: Alpena Combat Readiness Training Center
Address:
5884 A Street
Alpena, Michigan 49707
Tel: 989-354-6332
Fax: 989-354-6353
Director: Steven Tezak
Email: stezak@starbasealpena.org
Website: www.starbasealpena.org

*Alcona Community Schools*
Alcona Elementary School

*Alpena Public Schools*
Besser Elementary School
Ella M. White School
Hinks School
Lincoln Community School
Sanborn School
Wilson Community School

*Bingham Arts Academy*
Bingham Arts Academy

*Hillman Community Schools*
Hillman Elementary School

*Posen Consolidated School District No. 9*
Posen Elementary School

*Private Schools*
All Saints Catholic School
Cooperative Of Alpena-Area Christian Homeschoolers
Immanuel Lutheran School
Saint John Lutheran School
Seventh-Day Adventist Elementary School Of Alpena

*Rogers City Area Schools*
Rogers City Elementary School

*BATTLE CREEK*

STARBASE Battle Creek*
Service Component: National Guard
Military Location: 110th ATKW Battle Creek National Guard
Address:
3595 Mustang Avenue
Battle Creek ANG Base, Michigan 49037
Tel: 269-969-3219
Fax: 269-969-3251
Director: Bruce Medaugh
Email: bmedaugh@starbasebattlecreek.org
Website: None

*Albion Public Schools*
Altec

*Battle Creek Public Schools*
Franklin Elementary
Fremont Elementary
Urbandale Elementary School
Valley View Elementary
Venona Elementary

*Bellevue Public Schools*
Bellevue Elementary

*Colon Public Schools*
Colon Elementary

*Delton Kellogg Public Schools*
Delton Kellogg Middle School

*Hastings Community Schools*
Central Elementary School
Northeastern Elementary
Southeastern Elementary
Star Elementary

*Lakewood Public Schools*
Clarksville Elementary
Sunfield Elementary
West Elementary
Woodland Elementary

*Mar Lee School*
Mar Lee

*Maple Valley Schools*
Fuller Street Elementary

*Parchment Public Schools*
Northwood Elementary

*Pennfield Schools*
Dunlap Elementary

** Indicates location, also coordinates a DoD STARBASE 2.0 Program*

*Thornapple Kellogg Public Schools*
Page Elementary

*Three Rivers Community Schools*
Park Elementary

*MOUNT CLEMENS*

STARBASE One*
Service Component: National Guard
Military Location: Selfridge National Guard Base
Address:
27310 D Street
Selfridge ANGB, Michigan 48045
Tel: 586-239-4884
Fax: 586-239-5663
Director: Rick Simms
Email: rsimms@starbaseone.org
Website: www.starbaseone.org

*Anchor Bay Public Schools*
Ashley Elementary School
Great Oaks Elementary School
Lottie Elementary School
Maconce Elementary School
Naldrett Elementary School
Sugarbush Elementary School

*Armada Public Schools*
Krause Later Elementary School

*Charter - Detroit*
Allen Academy
Plymouth Educational Center

*Charter - Centerline*
Michigan Math & Science Academy

*Charter - New Haven*
Merritt Academy

*Detroit Public Schools*
Bennett Elementary School
Carver Stem Academy
Chrysler Elementary School
Clippert Academy
Davison Elementary School

*Lamphere Public Schools*
Hiller Elementary School

*L'anse Creuse Public Schools*
Donald J. Yacks Elementary School
Emma V. Lobbestael Elementary School
Francis S. Higgins Elementary School
Joseph M. Carkenord Elementary School
South River Elementary School

*New Haven Community Schools*
Endeavour Elementary School
New Haven Elementary School

*Mt. Clemens Public Schools*
Seminole Academy

*Private School - Clinton Twp*
Trinity Lutheran School

*Private School - St. Clair Shores*
St. Germaine Catholic School

*Richmond Community Schools*
Richmond Middle School

## MINNESOTA

*ST. PAUL*

STARBASE Minnesota*
Service Component: National Guard
Military Location: 133rd Airlift Wing
Address:
659 Mustang Avenue
St. Paul, Minnesota 55111
Tel: 612-713-2530
Fax: 612-713-2540
Director: Kim Van Wie
Email: kvanwie@starbasemn.org
Website: www.starbasemn.org

*Anoka-Hennepin Public Schools*
University Avenue School Aces

*Community Of Saints*
Community Of Saints

*Hopkins Public Schools*
Gatewood Elementary
Meadowbrook Elementary

*Minneapolis Public Schools*
Bryn Mawr Community School
Cityview
Emerson Silc (Spanish Immersion Learning Center)
Jefferson Community School
Lake Nokomis - Keewaydin
Loring
Pillsbury Elementary

** Indicates location, also coordinates a DoD STARBASE 2.0 Program*

*North St. Paul-Maplewood-Oakdale Public Schools*
- Carver Elementary
- Cowern Elementary
- Oakdale Elementary
- Skyview Elementary
- Weaver Elementary

*Private Schools*
- Frassati Catholic Academy
- Maternity Of Mary - St. Andrew
- Risen Christ Catholic School
- St. Jerome School
- St. John The Baptist
- St. Rose Of Lima Catholic School

*Rosemount-Apple Valley-Eagan Public Schools*
- Cedar Park Stem School
- Westview Elementary

*St. Paul Charter School*
- Achieve Language Academy
- Community Of Peace Academy

*St. Paul Public Schools*
- Battle Creek Elementary
- Como Park Elementary School
- Farnsworth Aerospace Elementary Magnet School 5-8
- Farnsworth Aerospace Elementary Magnet School Pre K-4
- Frost Lake Elementary
- Galtier
- Phalen Lake Hmong Studies Magnet

## MONTANA

*GREAT FALLS*

STARBASE Great Falls
Service Component: National Guard
Military Location: Montana National Guard 120th Airlift Wing
Address:
2800 Airport Avenue B
Great Falls, Montana 59404
Tel: 406-791-0806
Fax: 406-791-0339
Director: Wendy Fechter
Email: wendyfechter@mt.gov
Website: None

*Centerville Public School District*
- Centerville Elementary School

*Great Falls Public School District*
- Chief Joseph Elementary School
- Lewis & Clark Elementary School
- Lincoln Elementary School
- Longfellow Elementary School
- Loy Elementary School
- Meadowlark Elementary School
- Morningside Elementary School
- Mountain View Elementary School
- Riverview Elementary School
- Roosevelt Elementary School
- Sacajawea Elementary School District
- Sunnyside Elementary School
- Valley View Elementary School
- West Elementary School
- Whittier Elementary School

*Highwood Public School District*
- Highwood Elementary School

*Private Schools*
- Foothills Community Christian School
- Holy Spirit Catholic School

*HELENA*

STARBASE Fort Harrison
Service Component: National Guard
Military Location: Fort Harrison National Guard
Address:
1956 Mt Majo Street
Fort Harrison, Montana 59636
Tel: 406-324-3727
Fax: 406-324-3735
Director: Wendy Fechter
Email: wendyfechter@mt.gov
Website: None

*East Helena Public Schools*
- Robert H. Radley Elementary

*Helena Public Schools*
- Broadwater Elementary School
- Central Elementary School
- Four Georgians Elementary School
- Hawthorne Elementary School
- Kessler Elementary School
- Rossiter Elementary School

## NEVADA

*LAS VEGAS*

STARBASE Nellis
Service Component: Air Force Reserve
Military Location: Nellis Air Force Base
Address:
2841 Kinley Drive, Building 1619, Nellis AFB
Las Vegas, Nevada 89191
Tel: 702-575-3837
Fax: None
Director: Myles Judd
Email: mjudd@starbasenellis.com
Website: none

*Clark County*
Joseph Neal
Lomie Heard
Manch
Moapa Indian Reservation
Ute V. Perkins
Vail Pittman

## NEW MEXICO

*ALBUQUERQUE*

New Mexico STARBASE La Luz*
Service Component: Air Force
Military Location: Kirtland Air Force Base
Address:
1401 Maxwell Street SE,
Albuquerque, New Mexico 87117
Tel: 505-846-8042
Fax: 505-846-8932
Director: Ronda Cole
Email: ronda.cole.ctr@us.af.mil
Website: www.afrlnewmexico.com/afrl-la-luz-academy

21st Century Public Academy - Charter School
21st Century Public Academy

*Albuquerque Public Schools*
Chaparral Elementary School
Dolores Gonzales Elementary School
East San Jose Elementary School
Emerson Elementary School
Lowell Elementary School
North Star Elementary School
Painted Sky Elementary School
Petroglyph Elementary School
Sandia Base Elementary School

*Archdiocese of Santa Fe*
Our Lady of the Assumption Catholic School

*Christ Lutheran Church & School*
Christ Lutheran Church & School

*Eastern Navajo Education Line Office School District*
Baca/Dlo'ay Azhi Community School

*Grants-Cibola County Schools*
Mesa View Elementary School

*Hope Christian Schools*
Hope Christian Elementary School

*Los Lunas Public Schools*
Peralta Elementary School
Sundance Elementary School

*Magdalena Municipal Schools*
Magdalena Elementary School

*Moriarty-Edgewood Schools*
Moriarty Elementary School

*Seven Bar Elementary School*
Seven Bar Elementary School

*South Mountain Elementary School*
South Mountain Elementary School

*Wherry Elementary School*
Wherry Elementary School

## NORTH CAROLINA

*CHARLOTTE*

STARBASE Charlotte
Service Component: National Guard
Military Location: National Guard 145th Airlift Wing
Address:
4930 Minuteman Way
Charlotte, North Carolina 28208
Tel: 704-398-4819
Fax: 704-398-4822
Director: Barbara Miller
Email: barbara.h.miller6.ctr@mail.mil
Website: None

*Charlotte-Mecklenburg Schools*
Barringer Academic Center
Devonshire Elementary School
Highland Renaissance Academy
Idlewild Elementary School

** Indicates location, also coordinates a DoD STARBASE 2.0 Program*

John M. Morehead STEM Academy
Long Creek Elementary School
Sedgefield Elementary School
Torrence Creek Elementary School

*Elkin City Schools*
Elkin Elementary School

*Lincoln Charter School District*
Lincoln Charter School

*Lincoln County School System*
Kiser Intermediate School
Rock Spriings Elementary School
St. James Elementary School

*Madison County Schools*
Mars Hill Elementary School

*Polk County Schools*
Polk Central Elementary School

*Union County School System*
Rea View Elementary

*Thomasville City Schools*
Liberty Drive Elementary School

*KURE BEACH*

STARBASE Ft. Fisher
Service Component: National Guard
Military Location: North Carolina National Guard Training Center
Address:
116 Air Force Way
Kure Beach, North Carolina 28449
Tel: 910-251-7333, #5, #1
Fax: None
Director: Barbara Miller
Email: barbara.h.miller6.ctr@mail.mil
Website: None

*Brunswick*
Jessie Mae Monroe Elementary

*Lincoln*
Kiser Intermediate School

*Mecklenburg*
John M. Morehead STEM Academy

*New Hanover County Schools*
Bradley Creek Elementary School
Carolina Beach Elementary School
Castle Hayne Elementary School
Codington Elementary School
College Park Elementary
Eaton Elementary School
Forest Hills Elementary School
John J. Blair Elementary School
Mary C. Williams Elementary
Murrayville Elementary School
Pine Valley Elementary School
Rachel Freemen School of Engineering

## NORTH DAKOTA

*MINOT*

STARBASE North Dakota
Service Component: Air Force
Military Location: Minot Air Force Base
Address:
101 C Street
Minot AFB, North Dakota 58704
Tel: 701-727-3439
Fax: None
Director: Jenica R. Swenson
Email: jenica.swenson@minot.k12.nd.us
Website: www.minot.k12.nd.us/group/02f6f3d8-95ce-42dd-aae7-ad9038d43a1d

*Minot Public Schools*
Bel Air
Bell
Dakota
Edison
Lewis & Clark
Longfellow
McKinley
North Plains
Perkett
Roosevelt
Sunnyside
Washington

## OHIO

*DAYTON*

STARBASE Wright-Patt*
Service Component: Air Force
Military Location: Wright-Patterson Air Force Base
Address:
156 Spinning Road
Dayton, Ohio 45433
Tel: 937-938-4859
Fax: 937-904-8033
Director: Daniel Andrews
Email: daniel.andrews.1@us.af.mil
Website: edoutreach.wpafb.af.mil/starbase/index.html

*Beavercreek City Schools*
Parkwood Elementary

*Dayton Public Schools*
Kiser Pre K-8 Elementary
Westwood Pre K-9 School
World Of Wonder Elementary
Wright Brothers Pre K-8 School

*Fairborn Intermediate School*
Fairborn City Schools

*Huber Heights City Schools*
Charles Huber Elementary School
Monticello Elementary
Rushmore Elementary School
Valley Forge Elementary School
Wright Brothers Elementary School

*Jefferson Township Local Schools*
Blairwood Elementary School

*Kettering City Schools*
Beavertown Elementary School
Kettering Middle School

*Mad River Local Schools*
Mad River Middle School
Spinning Hills Middle School

*Miamisburg City Schools*
Miamisburg Middle School

*New Lebanon Local Schools*
Dixie Middle School

*Valley View Local Schools*
Valley View Junior High School

*Vandalia-Butler Schools*
Morton Middle School

*Wright State University*
Dayton Regional STEM School

*Xenia Community Schools*
Arrowood Elementary School
Cox Elementary School
McKinley Elementary School
Shawnee Elementary School
Tecumseh Elementary School

*Yellow Springs Village Schools*
Mills Lawn Elementary School

## OKLAHOMA

*OKLAHOMA CITY*

STARBASE Oklahoma - Oklahoma City*
Service Component: National Guard
Military Location: Tinker Air Force Base
Address:
3001 S. Douglas Boulevard
Oklahoma City, Oklahoma 73145
Tel: 918-833-7757
Fax: 918-833-7769
Director: Pamela Kirk
Email: pamela@starbaseok.org
Website: www.dodstarbase.org

*Arapaho/ Butler Public Schools*
Arapaho/Butler Elementary School

*Boone-Apache Public Schools*
Boone-Apache Elementary School

*Canute Public Schools*
Canute Elementary School

*Choctaw-Nicoma Park Schools*
Choctaw Elementary School
James Griffith Intermediate School
Nacoma Park Intermediate School
Westfall Elementary School

*Crutcho Public Schools*
Crutcho Elementary School

*Cyril Public Schools*
Cryril Elementary School

** Indicates location, also coordinates a DoD STARBASE 2.0 Program*

*Duncan Public Schools*
Horace Mann Elementary School

*Fletcher Public Schools*
Fletcher Elementary School

*Flower Mound Public Schools*
Flower Mound Elementary School

*Empire Public Schools*
Empire Elementary School

*Erick Public Schools*
Erick Elementary School

*Hammon Public Schools*
Hammon Elementary School

*Indiahoma Public Schools*
Indiahoma Elementary School

*Lawton Public Schools*
Almor West Elementary School
Crosby Park Elementary School
Eisenhower Elementary School
Geronimo Road Elementary School
Hugh Bish Elementary School
John Adams Elementary School
Lincoln Elementary School
Mark Twain Elementary School
Park Lane Elementary School
Pat Henry Elementary School
Pioneer Park Elementary School
Ridgecrest Elementary School
Sheridan Road Elementary School
Sullivan Village Elementary School
Swinney Elementary School
Washington Elementary School
Whittier Elementary School
Wilson Elementary School
Leedey Public Schools
Leedey Elementary School

*Merritt Public Schools*
Merritt Elementary School

*Mid-Del Public Schools*
Schwartz Elementary School

*Millwood Public Schools*
Millwood Arts Academy Middle School
Millwood Middle School

*Mountain View-Gotebo Public Schools*
Mountain View-Gotebo Elementary School

*Oklahoma City Public Schools*
Sequoyah Elementary School

*Private Schools*
Bishop John Carroll Catholic School
Lawton Academy of Arts & Sciences
Mercy Elementary School
St. Mary's Catholic School
St. Philip Neri Catholic School
Trinity Christian Academy

*Sentinal Public Schools*
McMurray Elementary School

*Sweetwater Public Schools*
Sweetwater Elementary School

*Thomas Fay Custer Schools*
Thomas Fay Custer Elementary School

*TULSA*

STARBASE Oklahoma – Tulsa*
Service Component: National Guard
Military Location: Tulsa National Guard Base
Address:
9131 E. Viper Street
Tulsa, Oklahoma 74115
Tel: 918-833-7757
Fax: 918-833-7769
Director: Pamela Kirk
Email: pamela@starbaseok.org
Website: www.dodstarbase.org

*Anderson Public Schools*
Anderson Elementary School

*Avant Public Schools*
Avant Elementary School

*Caney Valley Public Schools*
Caney Valley Elementary School

*Owasso Public Schools*
Barnes Elementary School
Mills Elementary School
Stone Canyon Elementary School

*Private Schools*
All Saints Catholic School
Home School
Rejoice Christian Elementary School
St. John's Catholic School
St. Joseph's Catholic School
Sts. Peter & Paul Catholic School

** Indicates location, also coordinates a DoD STARBASE 2.0 Program*

*Pryor Public Schools*
Jefferson Elementary School

*Sequoyah Schools*
Sequoyah School

*Tulsa National Guard Base*
Tech Kids Summer Camp

*Tulsa Public Schools*
Marshall Elementary School
McClure Elementary School
Peary Elementary School
Walt Whitman Elementary School
Wright Elementary School

*Union Public Schools*
Union Public Schools Johnson O'Malley Program

*Verdigris Public Schools*
Verdigris Upper Elementary School

## OREGON

*KLAMATH FALLS*

STARBASE Kingsley*
Service Component: National Guard
Military Location: Kingsley Field National Guard Base
Address:
302 Bong Street, Suite 19
Klamath Falls, Oregon 97603
Tel: 541-885-6472
Fax: None
Director: Denise Kortes
Email: denisekortes@yahoo.com
Website: None

*Butte Valley Unified School District*
Butte Valley Elementary School

*Klamath County School District*
Bonanza Elementary School
Chiloquin Elementary School
Ferguson Elementary School
Henley Elementary School
Keno Elementary School
Peterson Elementary School
Shasta Elementary School
Stearns Elementary School

*Klamath Falls City Schools*
Conger Elementary School
Mills Elementary School
Pelican Elementary School
Roosevelt Elementary School

*Private Schools*
Hosanna Christian Academy
New Horizons Christian Fellowship School
Triad School

*Tulelake Basin Joint Unified School District*
Tulelake Basin Elementary School

*PORTLAND*

STARBASE Portland
Service Component: National Guard
Military Location: Portland National Guard
Address:
6801 NE Cornfoot Road
Portland, Oregon 97218
Tel: 503-972-8630
Fax: None
Director: Denise Kortes
Email: starbaseportland@gmail.com
Website: None

*Beaverton*
Chehalem Elementary
McKay Elementary
Vose Elementary

*Canby*
Lee Elementary

*Portland Public Schools*
Astor Elementary
Cesar Chavez
Creston Elementary
Faubion Elementary
Harrison Park
Jason Lee Elementary
Rosa Parks
Scott Elementary
Sitton Elementary
Vernon Elementary
Woodlawn Elementary

*Reynolds*
Alder Elementary
Wilkes Elementary

** Indicates location, also coordinates a DoD STARBASE 2.0 Program*

## PUERTO RICO

*CAROLINA*

STARBASE Puerto Rico
Service Component: National Guard
Military Location: 156AW Muniz ANG Base
Address:
200 Jose A. Tony Santana Avenue.
Carolina, Puerto Rico 00979
Tel: 787-253-5100 X-2539502
Fax: 787-253-2513
Director: Urbano Ayala
Email: urbano.starbasepr@gmail.com
Website: None

*Aguadilla*
Liceo Aguadillano

*Bayamón*
Cristobal Colon

*Carolina*
PRNG dependants Summer Camp
Canóvanas
Félix Sánchez Cruz

*Corozal*
Fidel López Colón

*Florida*
Ricardo Rodríguez

*Guaynabo*
El Conquistador

*Gurabo*
Luis Muñoz Grillo
SU Sandalio Marcano

*Las Piedras*
Antonio Rosa Guzmán
Antonio Rosa Guzmán
Manuel Surrillo Sánchez
Matías Rivera

*San Juan*
Liga Atlética Policiaca Summer Camp
Rafael Lopez Sicardo

*Vega Alta*
Alfonso López García

*Yabucoa*
María T. Delgado
Quebrada Honda
Quemados

*Yauco*
Lena M. Franceschi Irizarry

## SOUTH CAROLINA

*BEAUFORT*

STARBASE MCAS Beaufort
Service Component: Marine Corps
Military Location: Marine Corps Air Station Beaufort, South Carolina
Address:
STARBASE MCAS Beaufort
Beaufort, South Carolina 29904
Tel: 843-524-1320
Fax: 843-524-1322
Director: Robert W. Semmler
Email: semmlerrw@gmail.com
Website: None

*Beaufort County School District*
Beaufort Elementary School
Beaufort Elementary School Academy of Math, Engineering and Science
Broad River Elementary School
Hilton Head Island Elementary School
Joesph S. Shanklin Elementary School
Lady's Island Elementary School
Mossy Oaks Elementary School
Okatie Elementary School
Port Royal Elementary School
Pritchardville Elementary School
Riverview Charter School
Robert Smalls International Academy
Saint Helena Elementary School
Whale Branch Middle School

*Catholic*
St. Gregory the Great Catholic School
St. Peters Catholic School

*Private School*
Beaufort Academy
Bridges Preparatory School
Holy Trinity Classical Christian School
Low Country Home School
Thomas Heyward Academy

*South Carolina/Fort Stewart/DoDDS-Cuba District DDESS*
Bolden Elementary School

*EASTOVER*

STARBASE Swamp Fox
Service Component: National Guard
Military Location: McEntire Joint National Guard Base
Address:
1325 South Carolina Road
Eastover, South Carolina 29044
Tel: 803-647-8126
Fax: 803-647-8195
Director: John M."Coach" Motley, Jr.
Email: john.m.motley.nfg@mail.mil
Website: www.scstarbase.org

*Calhoun County Public Schools*
Sandy Run K-8 School

*Diocese of Charleston*
St. John Neumann Catholic School
St. Joseph Catholic School
St. Peter's Catholic School

*Lexington School District Two*
B. C. Grammar School

*Lexington-Richland School District Five*
H. E. Corley Elementary School
Irmo Elementary School
Nursery Road Elementary School

*Richland School District One*
A.C. Moore Elementary School
Burnside Elementary School
Carver-Lyon Elementary School
Forest Heights Elementary School
Gadsden Elementary School
Hopkins Elementary School
Horrell Hill Elementary School
Millcreek Elementary School
Webber Elementary School

*Richland School District Two*
Catawba Trail Elementary School
Forest Lake Elementary School

*Sumter School District*
F. J. Delaine Elementary School
Willow Drive

## SOUTH DAKOTA

*RAPID CITY*

STARBASE NOVA Honor
Service Component: National Guard
Military Location: Camp Rapid
Address:
2823 West Main Street,
Camp Rapid, Building 801
Rapid City, South Dakota 57702
Tel: 605-737-6083
Fax: None
Director: Polly Unterbrunner
Email: polly@sdstarbase.org
Website: sdstarbase.org

*Custer School District 16-1*
Custer Elementary School
Hermosa Elementary
Eagle Butte School District 20-1
Cheyenne Eagle Butte Elementary School

*Hot Springs School District 23-2*
Hot Springs Elementary

*Kadoka Area School District*
Kadoka Elementary

*Meade School District 46-1*
Piedmont Valley Elementary School
Sturgis Elementary
Whitewood Elementary School

*New Underwood School District 51-3*
New Underwood Elementary

*Pierre Indian Learning Center*
Pierre Indian Learning Center

*Private School on Pine Ridge Indian Reservation*
Red Cloud Indian School

*Shannon County School District 65-1*
Batesland Elementary
Wolf Creek Elementary School

*St. Joseph's Indian School*
St. Joseph's Indian School

*Stanley County Public Schools 57-1*
Stanley County Elementary

STARBASE Rapid City
Service Component: National Guard
Military Location: Camp Rapid
Address:
2823 West Main Street,
Camp Rapid, Building 801
Rapid City, South Dakota 57702
Tel: 605-737-6803
Fax: None
Director: Polly Unterbrunner
Email: polly@sdstarbase.org
Website: sdstarbase.org

*Douglas School District*
Vandenberg Elementary School

*Rapid City Area Schools*
Canyon Lake Elementary School
General Beadle Elementary School
Horace Mann Elementary School
Knollwood Heights Elementary School
Rapid Valley Elementary School
Robbinsdale Elementary School
South Park Elementary School
Valley View Elementary School

*SIOUX FALLS*

STARBASE NOVA Courage
Service Component: National Guard
Military Location: South Dakota National Guard
Address:
801 W. National Guard Drive
Sioux Falls, South Dakota 57104
Tel: 605-367-4930
Fax: 605-367-4926
Director: Vonny Revell
Email: vonny@sdstarbase.org
Website: www.sdstarbase.org

*Andes School District*
Andes Central School

*Armour School District*
Armour Elementary School

*Big Stone School District*
Big Stone Elementary School

*Day County School District*
Enemy Swim Day School

*Huron School District*
Huron Elementary Schools

*Sisseton School District*
New Effington Elementary School

*Rosholt Elementary School*
Sisseton Elementary School

*Summit School Distirct*
Summit Elementary School

*Wagner School District*
Wagner Community School

*Waubay School District*
Waubay School

*Webster School District*
Webster Elementary School

*Wilmont School District*
Wilmont Elementary School

*Tiospa Zina Tribal School*
Tiospa Zina Tribal School

STARBASE Sioux Falls*
Service Component: National Guard
Military Location: South Dakota National Guard
Address:
801 W. National Guard Drive
Sioux Falls, South Dakota 57104
Tel: 605-367-4930
Fax: 605-367-4926
Director: Vonny Revell
Email: vonny@sdstarbase.org
Website: www.sdstarbase.org

*Garretson School District*
Garretson Elementary

*Sioux Falls School District*
All City Elementary
Anne Sullivan Elementary
Eugene Field Elementary
Garfield Elementary School
Hawthorne Elementary School
Hayward Elementary Schoool
Horace Mann Elementary
Laura B. Anderson Elementary School
Longfellow Elementary School
Lowell Elementary School
Renberg Elementary School
Robert Frost Elementary School
Sioux Falls Lutheran School
St. Lambert Elementary School
Terry Redlin Elementary School

** Indicates location, also coordinates a DoD STARBASE 2.0 Program*

## TEXAS

*AUSTIN*

Texas STARBASE-Austin
Service Component: National Guard
Military Location: Camp Mabry
Address:
2200 W. 25th Street
Austin, Texas 78703
Tel: 512-782-3554
Fax: None
Director: Patrick Yonnone
Email: patrick@starbaseaustin.org
Website: starbaseaustin.org

*Austin Independent School District*
Davis Elementary
McBee Elementary
Norman Elementary
Sunset Valley Elementary
Travis Heights Elementary School

*Del Valle Independent School District*
Creedmoor Elementary
Del Valle Elementary
Hillcrest Elementary
Hornsby-Dunlap
Popham Elementary
Smith Elementary

*Hays Cindependent School District*
Fuente Elementary School
Science Hall Elementary School
Tobias Elementary School

*Hutto Independent School District*
Hutto Elementary
Nadine Johnson Elementary

*Private Schools*
Our Savior Lutheran School
Redeemer Lutheran School
St. Austin Catholic School
St. Francis School
St. Ignatius Martyr Catholic School
St. Paul Lutheran School
St. Theresa's Catholic School
The Girl's School of Austin

*HOUSTON*

Texas STARBASE Houston*
Service Component: National Guard
Military Location: 147th Reconnaissance Wing, Ellington Field
Address:
14657 Sneider Street, Building #1055 & 1056
Houston, Texas 77034
Tel: 281-929-2034
Fax: 281-929-2036
Director: Loraine Guillen
Email: loraine.guillen@us.af.mil
Website: None

*Galena Park Independent School District*
Cimarron Elementary School
Cloverleaf Elementary School
Dr. Shirley J. Neeley Williamson Elementary
Galena Park Elementary
Green Valey Elementary School
Havard Elementary School
Jacinto City Elementary School
MacArthur Elementary
Normandy Crossing Elementary School
North Shore Elementary School
Purple Sage Elementary School
Pyburn Elementary School
Sam Houston Elementary School
Tice Elementary School
Woodlands Acres Elementary School

*Galveston-Houston Dioceses*
Our Lady of Lourdes Catholic School
St. Mary of the Purification Catholic School
St. Rose of Lima Catholic School
True Cross Catholic School

*Home Schools*
Faith Home School
Gulf Coast Christian Home School Scholars

*Houston Independent School District*
Cornelius Elementary School
George L. Sanchez Elementary School
James H. Law Elementary School
Leeona Pugh Elementary School
Park Place Elementary School
Pleasantville Elementary School
Valley West Elementary School

*Humble Independent School District*
Whispering Pines Elementary School

*Pasadena Independent School District*
Bailey Elementary School
Bobby Shaw Middle School

** Indicates location, also coordinates a DoD STARBASE 2.0 Program*

Carter Lomax Middle School
Dr. Dixie Melilo Middle School
Earnesteen Milstead Middle School
Fisher Elementary School
L. F. Smith Elementary School
Lonnie B. Keller Middle School
Morris Middle School
Williams Elementary School

*Sheldon Independent School District*
Garrett Elementary School

*SAN ANTONIO*

STARBASE Kelly
Service Component: Air Force Reserve
Military Location: JBSA-Lackland
Address:
203 Galaxy Road
JBSA-Lackland, Texas 78236
Tel: 210-925-3708
Fax: 210-925-3702
Director: Ronald N. Jackson
Email: starbasekelly@gmail.com
Website: None

*Archdiocese of San Antonio Catholic Schools*
Mount Sacred Heart Catholic School
St. Leo the Great Catholic School

*Edgewood Independent School District*
Cisneros Elementary School
Gardendale Elementary School
Henry B. Gonzalez Elementary School
Las Palmas Elementary School
Loma Park Elementary School
Roosevelt Elementary School
Stafford Elementary School
Winston Elementary School

*Southwest Independent School District*
Elm Creek Elementary School
Sky Harbour Elementary School

*South San Antonio Independent School District*
Carrillo Elementary School
Five Palms Elementary School
Frank Madla Elementary School

## UTAH

*OGDEN*

STARBASE Hill Screaming Eagles*
Service Component: Air Force
Military Location: Hill Air Force Base
Address:
5731 E Avenue
Hill AFB, Utah 84056
Tel: 801-586-7494
Fax: None
Director: Frances Bradshaw
Email: frances.bradshaw@starbasehill.com
Website: www.starbasehill.com

*Davis County School District*
Adelaide Elementary
Antelope Elementary
Crestview Elementary
Doxey Elementary
Eagle Bay Elementary
Endeavour Elementary
Heritage Elementary
King Elementary
Layton Elementary
Lincoln Elementary
Meadowbrook Elementary
Sand Springs Elementary
South Clearfield Elementary
Sunset Elementary
Tolman Elemenarty
Washington Elementary
West Point Elementary

## VERMONT

*RUTLAND*

STARBASE Vermont - Rutland
Service Component: National Guard
Military Location: Armed Forces Reserve Center
Address:
2143 Post Road
Rutland, Vermont 05701
Tel: 802-786-3820
Fax: 802-786-3822
Director: Dan Myers
Email: dan@starbasevt.org
Website: www.starbasevt.org

** Indicates location, also coordinates a DoD STARBASE 2.0 Program*

*Addison Central Supervisory Union*
Benson Village School
Castleton Elementary School
Orwell Village School
Salisbury Community School
Shoreham Elementary School

*Rutland Central Supervisory Union*
Rutland Town School
Wardsboro Elementary
West Rutland Central School
Windham Elementary

*Rutland City School District*
Rutland Intermediate School

*Rutland Diocese*
Rutland Area Christian School
Christ The King School

*Rutland Norhteast Supervisory Union*
Barstow Elementary School
Lothrop School
Neshobe School

*Rutland Northwest Supervisory Union*
Poultny School
Rochester School
Stockbridge Central School

*Rutland South Supervisory Union*
Wallingford Elementary School

*Southwest Vermont Supervisory Union*
Shaftsbury Elementary

*Windham Central Supervisory Union*
Jamaica Village School

*Windsor Southeast Supervisory Union*
Alberts Bridge School
Killington Elementary School
Mount Holly Elementary
Proctor Elementary
Ripton Elementary School
Wells Village School

*Windsor Southwest Supervisory Union*
Cavendish Town Elementary School

*SOUTH BURLINGTON*

STARBASE Vermont - South Burlington
Service Component: National Guard
Military Location: Vermont National Guard
Address:
62 NCO Drive
South Burlington, Vermont 05403
Tel: 802-660-5201
Fax: 802-660-5940
Director: Dan Myers
Email: dan@starbasevt.org
Website: www.starbasevt.org

*Addison Northeast Supervisory Union*
Lincoln Community School

*Addison Northwest Supervisory Union*
Vergennes Elementary

*Burlington Diocese*
Christ The King School
Saint Francis Xavier School
Saint Michaels

*Burlington School District*
C. P. Smith School
Integrated Arts Academy
John J. Flynn Elementary

*Franklin Central Supervisory Union*
Saint Albans Town Educational Center

*Franklin Northwest Supervisory Union*
Swanton Central

*Franklin West Supervisory Union*
Bellows Free Academy Fairfax
Fletcher Elementary

*Grand Isle Supervisory Union*
Folsom Education & Community Center
Grand Isle School

*Lamoille North Supervisory Union*
Cambridge Elementary School

*South Burlington School District*
Orchard Elementary School

*Washington Central Supervisory Union*
East Montpelier Elementary School

*Winooski School District*
John F. Kennedy School

## VIRGINIA

*WINCHESTER*

Winchester STARBASE Academy
Service Component: National Guard
Military Location: Virginia National Guard; 3rd Battalion; 116th Infantry Regiment
Address:
181 Pendleton Road
Winchester, Virginia 22602
Tel: 540-686-4964
Fax: None
Director: Susan Corrigan
Email: susan.b.corrigan.nfg@mail.mil
Website: starbasewinchester.webs.com

*Clarke County Public Schools*
D. G. Cooley Elementary

*Frederick County Public Schools*
Apple Pie Ridge Elementary
Bass-Hoover Elementary
Gainesboro Elementary
Greenwood Mill Elementary
Indian Hollow Elementary
Redbud Run Elementary

*Independent*
Randolph-Macon Academy
Reach Homeschool
Sacred Heart Academy

*Winchester Public Schools*
Frederick Douglass Elementary
Garland Quarles Elementary
Virginia Avenue Charlotte DeHart Elementary

*Shenandoah County Public Schools*
Signal Knob Middle School

## WEST VIRGINIA

*CHARLESTON*

West Virginia STARBASE Academy
Service Component: National Guard
Military Location: McLaughlin ANGB
Address:
1679 Coonskin Drive
Charleston, West Virginia 25311
Tel: 304-341-6440
Fax: None
Director: Robin Barnette
Email: robin.d.barnette.nfg@mail.mil
Website: www.wvstarbase.org

*Kanawha County*
Alum Creek Elementary School
Anne Bailey Elementary School
Belle Elementary School
Bible Center Elementary School
Bridge Elementary School
Cedar Grove Elementary School
Central Elementary School
Chamberlain Elementary School
Chesapeake Elementary School
Clendenin Elementary School
Dunbar Elementary School
Edgewood Elementary School
Elk Center Elementary School
Grandview Elementary School
Holtz Elementary School
Kanawha City Elementary School
Kenna Elementary School
Mary Ingles Elementary School
Midland Trail Elementary School
Montrose Elementary School
Nitro Elementary School
Overbrook Elementary School
Pinch Elementary School
Richmond Elementary School
Ruffner Elementary School
Ruthlawn Elementary School
Sharon Dawes Elementary School
Shoals Elementary School
Weberwood Elementary School
Weimer Elementary School

*MARTINSBURG*

STARBASE Martinsburg*
Service Component: National Guard
Military Location: 167th Airlift Wing
Address:
222 Sabre Jet Boulevard
Martinsburg, West Virginia 25405
Tel: 304-616-5501
Fax: 304-616-5478
Director: Sherra Triggs
Email: sherra.l.triggs.civ@mail.mil
Website: www.starbasemartinsburg.webs.com

*Berkeley County Schools*
Eagle School Intermediate
Faith Christian Academy
Mill Creek Intermediate
Mountain Ridge Intermediate
Orchard View Intermediate
Potomack Intermediate
St. Joseph School
Tomahawk Intermediate

*Jefferson County Schools*
C.W. Shipley Elementary
Ranson Elementary
T.A. Lowery Elementary
Wright Denny Intermediate

## WISCONSIN

*MILWAUKEE*

STARBASE Wisconsin
Service Component: National Guard
Military Location: U.S. Army Reserve Center
Address:
5130 W. Silver Spring Drive
Milwaukee, Wisconsin 53218
Tel: 414-535-5786
Fax: None
Director: John W. Puttre
Email: jputtre@starbasewi.org
Website: www.starbasewi.org

*Milwaukee Public Scools*
Auer Elementary School
Browning Elementary School
Cass Street Elementary School
Congress Elementary School
Cooper Elementary School
Downtown Montessori
Early View Elementary School
Engleburg Elementary School
Fifty-third Street Elementary School
Grantosa Drive Elementary School
Hampton Elementary School
Hawthorne Elementary School
Hopkins-Lloyd Elementary School
Kilbourn Elementary School
Klug Elementary School
Manitoba Elementary School
Metcalfe Elementary School
Milwaukee Spanish Immersion School
Neeskara Elementary School
Parkview Elementary School
Riley Elementary School
Samuel Clemens Elementary School
Sherman Elementary School
Stuart Elementary School
Townsend Elementary School
Walt Whitman Elementary School
Westside Elementary School
Zablocki Elementary School

## WYOMING

*CHEYENNE*

Wyoming STARBASE Academy*
Service Component: National Guard
Military Location: Wyoming National Guard
Address:
5410 Bishop Boulevard
Cheyenne, Wyoming 82009
Tel: 307-777-8191
Fax: 307-777-8190
Director: Barbara Marquer
Email: barbm@starbasewy.org
Website: starbase.wyo.gov

*Laramie County School District #1*
Afflerbach Elementary
Alta Vista Elementary
Anderson Elementary
Arp Elementary
Baggs Elementary
Bain Elementary
Buffalo Ridge Elementary
Cole Elementary
Davis Elemetary
Dildine Elementary
Fairview Elementary
Freedom Elementary
Gilchrist Elementary
Goins Elementary
Hebard Elemnetary

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Henderson Elementary
Hobbs Elemenatry
Jessup Elementary
Miller Elementary
Pioneer Park Elementary
Poder Academy Charter School
Rossman Elementary
Saddle Ridge Elementary
Sunrise Elementary
Willadsen Elementary

*Laramie County School District #2*
Burns Elementary
Carpenter Elementary
Pine Bluffs Elementary

*Private Schools*
Noah Webster Christian Academy
St. Mary's Catholic School

"I am so happy that this program is available! As I'm sure you know, science takes a major back burner to Math and Reading in the classroom (even though it provides the context to make pure Math way more interesting). It's hard to teach many of these topics in depth... Thanks for providing hands-on STEM experiences, and for the in-depth, rigorous content. Most of all, thanks for giving the kids things to think and wonder about for the future!"

Beth McKay, Teacher participating DoD STARBASE Topeka, Topeka, KS


**For more information contact:**

**Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs (OASD/M&RA)**
**1500 Defense Pentagon**
**Washington, DC 20301-1500**

**www.DoDSTARBASE.org**